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II

In the preceding lecture the course of heart disease in childhood was considered from various aspects, and it was shown that with proper medical care the prognosis was likely to be favourable. In this lecture I would like to discuss the details of treatment and after-care of the rheumatic child, and to indicate possible ways of improving and extending this service.

Thornton (1937) has recently made a valuable comprehensive review of the London scheme for the treatment and supervision of juvenile rheumatism, and many of the comparative figures which follow are derived from his article.

One of the problems which confronts the doctor who has been looking after a child with rheumatism is to decide on the best form of treatment once the acute stage is over. Such questions as when the child can get up, whether he may attend school, the amount of exercise he can take, and what precautions are necessary in his future mode of life are bound to arise. None of them can be answered without reference to the child's "rheumatic state," since the future conduct of the case depends primarily on whether or not the rheumatic process is still active. This is of such importance that the doctor must be well acquainted with all the methods of estimating the stage which the disease has reached.

SIGNS OF RHEUMATIC ACTIVITY

The general condition of the child gives some information and a steady gain in *weight* is nearly always a propitious sign. Close attention to the *pulse-rate* gives the best indication of the actual state of the heart. Observations should be made for a number of days and comparison of the rate during sleep with the rate when the child is awake will help to differentiate a nervous tachycardia from active carditis (Schlesinger 1932). Recrudescence of rheumatic infection is often foreshadowed by a gradual quickening of the heart's action. Complete reliance cannot be placed on the *temperature*, since active rheumatism is so often an afebrile disease, and slight pyrexia may easily have other causes. Allowance should also be made for the normal temperature of each individual, for many rheumatic children give a fairly constant oral reading of 97° F., and they might reasonably be considered febrile with small rises in the region of 98·4° F. In others 99° F. is the normal temperature.

Extension of *physical signs* in the heart, such as further enlargement or involvement of other valves, points clearly to a smouldering cardiac inflammation. Finally, it is hardly necessary to point out that the presence of *nodules* or *chorea* is obvious evidence of active disease. Estimation of the *sedimentation-rate* of the red blood-cells is the most delicate test of all and is of the greatest value, provided it is considered in conjunction with other signs of activity. If there is any doubt, more than one observation should be made, and as it is a non-specific reaction, other febrile conditions must be excluded. Active rheumatic carditis, in the absence of gross failure, is associated with a high sedimentation-rate.

With a little practice the test can be easily performed by a prick of the finger; estimations can thus be made at fortnightly intervals, and the child should not be allowed to get up until the sedimentation-rate has fallen to normal (Payne and Schlesinger 1935). When subcutaneous nodules are present the sedimentation-rate is useful in determining the probable turn the disease will take. The first indication that nodules are about to vanish and that the general rheumatic inflammation will subside is a return of a high sedimentation-rate to normal. Conversely, a persistently raised sedimentation-rate is a clear indication that the end of the active phase has not been reached and that the nodules will remain for an indefinite period.

The prolonged character of rheumatic infection in childhood has been repeatedly emphasised, but it is only recently that clear-cut methods of assessing the "rheumatic state" have been established.

CONVALESCENT HOME TREATMENT

In the past lack of accommodation and a long waiting-list at the large city hospitals often made it necessary for children who had lately passed through an acute attack of rheumatism to be discharged home incompletely cured, with the rheumatic process still active. They were advised further rest, but under their unsatisfactory domestic conditions this could not be secured and they were often forced to come long distances to hospital out-patient departments for further medical supervision.

It was chiefly to obviate this that special country convalescent homes were founded, and it soon became apparent that an open-air life gave rheumatic children a much better chance of throwing off any residual infection. The scheme, however, entails more than the mere allocation of a country house for this purpose. To obtain the best results, the site should be carefully chosen and the buildings specially planned. A trained nursing staff is essential, and the doctors in charge should be well acquainted with the vagaries of the disease and must have the means of applying the clinical tests for rheumatic "activity" which have just been given. In fact, these special institutions should really be run more on the lines of a country hospital rather than on those of a country home; otherwise disappointing results may be expected. The continuation of some form of education is also important.

Many years ago Poynton (1912) urged the need for better convalescent treatment of rheumatic children in this country. It was left to the Invalid Children's Aid Association to put his doctrine into practice, and they opened the first special home for children with heart disease, the Edgar Lee, in 1912. In 1924 the same association provided a second and larger home, Kurandai, in Sussex, which was later transferred to West Wickham, Kent, with accommodation for 80 beds in specially designed open-air wards. Meanwhile a comprehensive scheme had been organised in Birmingham, and in 1921 Baskerville with 90 beds was set aside for the special educational

* The Milroy lectures for 1938, delivered before the Royal College of Physicians of London on Feb. 24th and March 1st. Lecture I appeared in our last issue.

treatment of children recovering from chorea and carditis. In London the problem soon became too urgent and extensive to be dealt with entirely by individual or charitable organisations, and the Ministry of Health through the energetic influence of Sir George Newman and Sir Frederick Menzies sought to devise a national scheme. As a result in 1926 the London County Council set aside 60 beds at Carshalton for the purpose; this proved so successful that they extended the service to four special hospitals situated in the country, and they now have accommodation for 900 rheumatic children. This number, together with the additional 200 beds provided by the Invalid Children's Aid Association and other voluntary bodies—e.g., Hospital for Sick Children's home at Lancing and Cheyne Hospital at Chelsea—makes ample provision for London school-children,† and there is no reason why every case of incipient carditis should not have a proper period of convalescence. Other parts of the United Kingdom however, with notable exceptions, are not so well equipped for the treatment of rheumatic children (Board of Education 1937).

The incidence of juvenile rheumatism is known to be especially high in the large densely populated cities, so there is great need for an extension to other towns of the schemes existing in London, Birmingham, Bristol, Cardiff, and to a more limited extent in Liverpool and Leeds. There are hopeful signs that this will gradually be brought about. Improved convalescent arrangements are relatively recent in most of the cities mentioned, and Leicester and Sheffield have projects in view.

A few more observations remain to be considered before leaving the subject of convalescent homes. We have seen that their chief aim is first to ascertain the child's rheumatic "state," and, if this still proves active, to render it quiescent by further rest in open-air surroundings and by other measures directed to the improvement of the child's general health. On occasion this will necessitate the removal of local foci of infection, such as septic teeth and tonsils. Once the quiescent stage has been reached the patient may be allowed to get up for a gradually increasing number of hours, careful watch being kept on the heart and general condition. In this way the rheumatic child may be guided back to the grade of exercise and mode of life which he can comfortably lead in the future, and in the majority surprisingly few restrictions will ultimately be found necessary.

It is difficult to obtain reliable figures concerning the fate of rheumatic children treated at home and at special convalescent homes. To be strictly comparable the children would have to be drawn from one district. Glover (1930) has shown that the incidence and virulence of acute rheumatism is steadily declining, so that the observations would also have to be made over the same years in each series. A rough comparison might be made by taking the after-histories compiled by Wallace (1937) of 300 adolescents and young adults who had suffered from acute rheumatism and carditis in childhood. Wallace deals with children in Scotland, where, in his opinion, the same decline in the severity of the disease has not taken place, and this must presumably be taken into account. His cases had not received consistent convalescent treatment, and it is therefore of some significance to find that the mortality among them (25·6 per cent.) was double that of the West Wickham series (12·3 per cent.), for whom prolonged treatment in the country had been provided.

† This has been estimated as 1·7 beds per 1000 elementary school-children.

RELAPSES

A question often asked is how many relapses occur among rheumatic children after their discharge from convalescent hospitals. The answer is not simple, for much depends on the kind of home and school life to which they return, and on the number of times they are exposed to acute upper respiratory infections.

Recurrences of rheumatism are admittedly high; the figure is 35 per cent. among those who were discharged from West Wickham, and this is much lower than the 60–70 per cent. given by other investigators (Wallace 1937, Mackie 1926, Wilson, Lingg, and Croxford 1928).

One of the criticisms often levelled at the system of special convalescent homes is the risk of upper respiratory infections spreading through a community known to be particularly susceptible to them. This risk has not been overrated and its dire effect on the rheumatic child has been the subject of numerous communications. Unless proper precautions are taken, convalescence in these homes will certainly defeat its own object and may do more harm than good. The medical authorities in charge of these institutions should therefore make routine arrangements for dealing with this emergency, and the nursing staff must be alive to its danger.

Details of the existing scheme at West Wickham have been published elsewhere (Poynton and Schlesinger 1937). They are of such importance, however, that I would like to describe them shortly once again.

PROPHYLACTIC MEASURES IN REGARD TO TONSILLITIS

Acute nasopharyngitis in childhood often produces so few symptoms that it may pass unrecognised. A thorough examination of the throat must therefore be made whenever a child is indisposed or shows a sudden rise of temperature. The value of *aspirin* in preventing rheumatic relapses has already been mentioned in the first lecture. It must be given immediately after the onset of pharyngitis or tonsillitis and continued daily for four weeks. The dose, thrice daily, varies according to the age of the child: from five to eight years, 7 grains; from nine to fourteen, 10 grains; and above fourteen years, 10–12 grains.

Since the introduction of this form of prophylactic therapy at West Wickham serious relapses following tonsillitis rarely arise. On the occasions when fresh rheumatism or carditis does occur, it takes a much milder form, and virulent fatal forms of pericarditis are now seldom encountered. In some way the aspirin "damps" down the whole rheumatic process, and the intervening "silent" period between throat infection and relapse is often appreciably prolonged. Acute rheumatic fever with high temperature and considerable illness is replaced by a relatively milder form of "miniature rheumatic fever" (see Figure).

On the same grounds a course of aspirin should be given to rheumatic children as a routine after tonsillectomy.

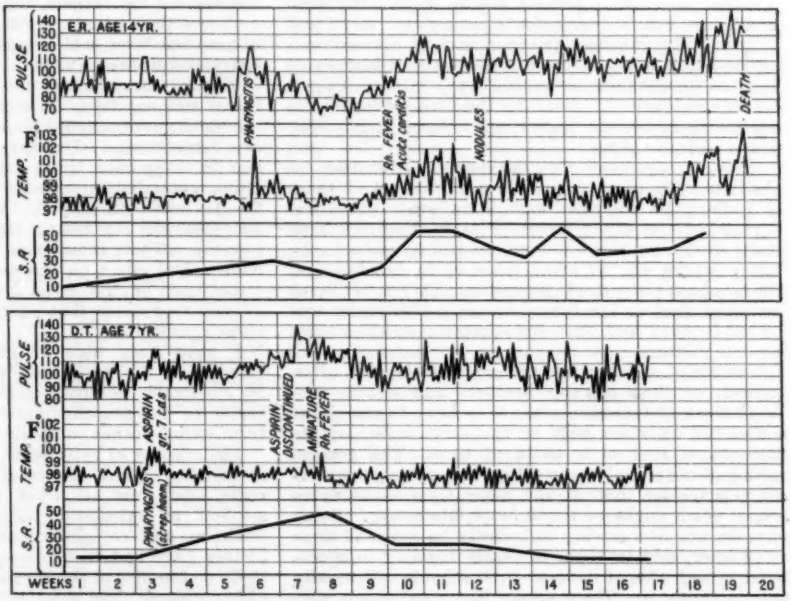
Various measures are required to prevent epidemics of tonsillitis. A child with an acute nasopharyngeal infection should be strictly isolated until a throat culture shows no further evidence of hæmolytic streptococci. Glover (1930) has shown how "droplet infection" can spread the disease, and due regard should be paid to the prevention of this danger by proper spacing of the beds, adequate ventilation, avoidance of overcrowding, and regular sterilisation of the crockery and cutlery.

Experience at West Wickham has shown that these are essential precautions.

RHEUMATISM CLINICS

It is just ten years since the first two rheumatism clinics were opened in London. Afterwards the scheme extended rapidly and the city now possesses twenty such supervisory centres. Ten of them are staffed and equipped by the London County Council, and the remaining ten are organised in the out-patient department of certain of the voluntary hospitals, with a monetary grant from the Council. Similar centres have been provided by boroughs and county councils in the vicinity of London and in other parts of England, but they are still lacking in many districts, and the general scheme falls far short of that provided for tuberculosis throughout the kingdom.

The function of these clinics is to establish a diagnosis in doubtful cases and to supervise the health and life of rheumatic children, particularly those with heart disease. Patients are drafted to these centres by school medical officers, private doctors, physicians in various hospital departments, and after convalescence by the rheumatism section of County Hall. Thornton (1937) estimated that over 6000 children attended rheumatism clinics during 1935, and London may be congratulated on having inaugurated such a comprehensive scheme in place of the old haphazard method of treatment.



Effect of aspirin in preventing serious rheumatic relapses after acute throat infection. *Above:* Fatal case that did not receive this treatment. *Below:* One in which aspirin was given and the relapse was very mild. S.R. = Sedimentation-rate.

One or two mild criticisms of the system might be made. There is undoubtedly a difference of opinion at certain of the centres regarding the kind of life a child with an old cardiac lesion may be allowed to lead. The standard adopted for certification of children to attend a school for physical defectives (P.D. school) also varies considerably among the forty odd London certifying medical officers. Some school doctors in their zeal to prevent serious heart disease will keep children with the mildest cardiac lesions unnecessarily at a P.D. school, and so create a harmful atmosphere of semi-invalidism for the child and its parents. Other medical officers take up the opposite attitude and regard the P.D. school as a place only for children with seriously damaged hearts. These are obviously extreme views and most school doctors adopt an intermediate course. Naturally a certain amount of latitude must be allowed the certifying officer, who is best able to judge the merits of each case, and there also exists a kind of court of appeal at headquarters to whom any doubts or difficulties can be referred.

A certain lack of continuity in the method of treatment and after-care is also bound to arise with the present system, for it is more than likely that a rheumatic child will come under the care of a succession of doctors. The voluntary hospital would appear to provide the ideal arrangement, as in most cases in-patient treatment is followed by regular out-patient attendance after a period of convalescence. Unfortunately old out-patients are quite often seen by junior members of the medical staff and unless the hospital has a rheumatic clinic, or the physician in charge of out-patients is particularly interested in juvenile rheumatism, the after-care of these children with heart disease is left to a series of young doctors who have little experience of the disease. This is one of the reasons why it has been found desirable to supplement hospital attendance by school medical supervision, but here again there is no guarantee that the child will be seen by the same doctor at each examination; in any case this will cease at the age of 14 years if the child attends an ordinary elementary school. Moreover, the school doctor has no means of treating the rheumatic child, and should this be considered necessary he must be referred back to the hospital or rheumatism clinic. The school medical and hospital services still work somewhat apart and the liaison between the two might be closer, although the London County Council rheumatism section is endeavouring to improve this fault.

Lastly, we must not forget that it is the private practitioner who treats many children during the acute attack and supervises their health until they grow up. In many ways this is the best arrangement.

SPECIAL SCHOOLS

According to Thornton (1937) 16 per cent. of the children discharged from rheumatism hospital units

are considered unfit to attend ordinary school and are therefore transferred to one of the Council schools for physical defectives. London has 29 such schools, and about half the pupils who attended in 1935 were cardiac cases, mostly of rheumatic origin.

The whole régime of these schools is specially arranged for the purpose. Children are transported to and from school by special conveyances; they remain at school for midday dinner and rest after the meal. The whole building is on the ground floor and is constructed on open-air lines. A nurse is in constant attendance and medical visits are paid once a fortnight. School periods are 5½ hours daily with about an hour's break for the midday meal and a rest. The leaving age is raised to sixteen and senior pupils have tuition in some form of handicraft such as dressmaking or embroidery, with an eye to future employment. Similarly the boys are taught the rudiments of certain trades which later in life may prove useful to them.

This arrangement for the proper education of children with heart disease is admirable, and there is nothing to compare with it in other countries. Certain of the other larger cities in England have made similar provision in open-air and special schools, but nowhere on the same scale as in London and Birmingham (Board of Education 1937). It is to be hoped that in the future existing deficiencies will be made good and that the scheme may eventually become national.

Naturally children at special schools are often envious of their healthy brothers and sisters who begin work at fourteen, while they have to remain at school for an extra year or two, and some parents also regard this as a waste of time. The general raising of the school age to fifteen may largely counteract this feeling, but at the same time those extra school years might be made more interesting. Some girls do not like sewing sufficiently to make it their work later, and to them the early training in shorthand typing offered in some P.D. schools is generally very acceptable. There seems to be no reason why these classes should not be extended to the rest of the P.D. schools. If it were also possible to include a course of domestic economy such as cooking and light laundry, it might hold their interest in school and at the same time train them to become good housewives for the future.

HOUSING

An important part of the London County Council rheumatism scheme is an attempt to ameliorate unsatisfactory home conditions. Since the rheumatic child is particularly susceptible to an unhealthy environment, it was realised that much of the good done by prolonged institutional treatment might be counteracted by the child returning to a damp ill-ventilated dwelling. Arrangements are therefore made for obtaining a detailed report of the home conditions of all children who receive institutional treatment. Structural and sanitary defects are reported to the borough medical officer of health who can take immediate action. Thornton (1937) states that during 1935, 225 reports of unsatisfactory housing conditions were received by the London County Council rheumatism section, as a result of which the defects present were remedied or alternative accommodation expedited. This scheme could well be more widely adopted throughout the country.

SOCIAL CONDITIONS

There are conflicting reports as to whether poor social conditions play a greater part in promoting rheumatism than other diseases in childhood. The conclusions reached by a Medical Research Council committee (1927) failed to reveal any differences or any special factor in the social circumstances of rheumatic children which might be described as causative. On the other hand the maternal care was found to be inferior, the amount of exposure greater, and the clothing less adequate among the rheumatic group than among the controls. Illness was also commoner among the parents of rheumatic children. Excess of starch and lack of fat in the diet has been blamed by some (Warner and Winterton 1935), and various vitamin deficiences have been held responsible by others. The marked influence of overcrowding on the incidence of rheumatic heart disease has been well demonstrated in Bristol (Bruce Perry and Roberts 1937).

Most of these factors can be related to unhygienic home surroundings, in which the mother is often unable to devote enough time and care to each member of a large family. Holidays in the country are short and in many cases quite out of the question, so that minor catarrhal infections or acute illnesses are apt to become protracted. Economic considerations are generally to blame and often there is actual poverty. There is no doubt that these circumstances have a bad effect on the general health of the child population of the large cities, and there is some evidence to show that rheumatism flourishes under these conditions.

I have been able to make a rough study in London of the social conditions in the families of 90 rheumatic children and to compare them with those of 90 non-rheumatic children who suffered from various other complaints.

The number of children in each family, the number of dwelling-rooms, the total family income, and the rents paid were all taken into consideration. The method of calculation adopted is open to some criticism and certainly many important subsidiary factors have had to be disregarded, yet it does seem that the families of the rheumatic group lived in worse circumstances than those of the controls.

TABLE I—SOCIAL CIRCUMSTANCES OF RHEUMATIC AND NON-RHEUMATIC CHILDREN

—	Rheumatic (90 families).	Non-rheumatic (90 families).
Number of children	496	310
Total family wages per week less rent	£210 6s. 1d.	£208 17s. 5d.
Average money available per person per week*	8s. 4d.	13s. 6d.
Total number of rooms	292	246
Average number of rooms per family	3¼	2¾
Average number of children per room (excluding parents accommodation)	1¾	1¼
Total rents paid	£66 1s. 5d.	£77 13s. 3d.
Average weekly rent for each family	14s. 8d.	17s. 3d.

* No calculation is made for fathers' expenses, such as fares to work, insurance, and other personal expenses of the parents.

Reference to Table I will show that less money was available per child and there was more overcrowding among the "rheumatic" families than among the others. This is largely accounted for by the difference in the size of the families in the two groups, although the total weekly wages are almost identical. The cases, however, were chosen at random and they are fair

samples of London children who are recommended convalescence either for a rheumatic or some other complaint. A large family of children is an obvious way in which the financial resources may become strained, and this was apparently one of the main contingencies with which the "rheumatic" group had to contend (cf. Brockington 1938).

Faced with the problem of having to feed more mouths and requiring at the same time more rooms to live in, the difficulties were met by paying lower rents. There was no opportunity of making home visits, but one might hazard a guess that more rooms at a cheaper rate would probably affect the quality of the accommodation. Even with this economy in rent considerably less money was available for the clothing, feeding, health, and general upbringing of each individual child among the rheumatic group than among the controls. In this way the social level, the father's type of employment, and the wages earned may all be strikingly similar in rheumatic and non-rheumatic families and yet the living conditions can be very different. The numbers studied are far too small to enable me to dogmatise but they suggest that one important predisposing factor in juvenile rheumatism is a large family living on insufficient means.

MUNICIPAL AND NATIONAL CONSIDERATIONS

The existing arrangements for looking after the health of the rheumatic child and adolescent are somewhat complicated and differ in various parts of the country. As a rule the public health authority and the local education authority share the responsibility. The Board of Education also undertakes, with certain provisions, to make a grant to cover half the expenses incurred in this connexion by the local education authority. Such a scheme is admirable but can only be carried out in districts which possess the necessary accommodation for convalescent cases. This is still lacking in many districts, especially in the Midlands and the North (Glover 1935). Recently the Board of Education (1936) urged local authorities of the large industrial areas to make better provision for the rheumatic child, either by coöperating with the existing voluntary agencies or by creating their own residential schools.

So much seems to depend on the policy of the local public health and education authorities. Usually these two bodies are jointly administered by the same county borough council, and the success or failure of a rheumatism scheme will be largely influenced by the amount of enthusiasm shown by the local man, who so often combines the post of school medical officer and medical officer of health. The chief function of the Ministry of Health and Board of Education in these matters is to point out existing deficiencies and advise where improvements can be made. The responsibility rests with the local authorities, and it is to be hoped that what has been achieved in many of the large cities will eventually be adopted by all. The Board of Education is doing its best to encourage this and, as already mentioned, is always willing to give considerable financial aid.

EMPLOYMENT AND AFTER-CARE

The doctor's responsibility does not end when the child leaves school. This is an important stage in any child's life and especially so in those who have cardiac affections. The special care and supervision of the school medical service ceases, and young boys and girls find themselves suddenly at liberty and generally eager to begin work. Although still under parental care, control is no longer so easy, with the result that the life led by these young wage-earners is not always ideal.

The choice of employment is especially important. If the decision is left to the boy or girl, the tendency is to drift into occupations already chosen by elder healthy brothers and sisters. The type of work is not always suitable for old cardiac cases and a false step in this direction may end disastrously. Public health authorities in London and many of the larger cities, being fully aware of these problems, certainly do their best to launch the child leaving school into the most suitable career. Every child is medically examined during the last school year and if some condition is present which could be prejudiced by certain employments, a statement to this effect is made in the medical report. A school-leaving conference is held at about this time with the object of advising the parents as to the kind of work which, from the child's health and school record, would appear to be the best.

The *After-Care Association*, a voluntary body now in existence for thirty years, makes itself responsible for children who have been at P.D. schools. It is in touch with firms connected with over a hundred different occupations and trades, and is thus able not only to advise but also to place in the right sort of work most of those who are sent to them for help. In addition this association gives a great deal of other general assistance to these young people, who leave school somewhat incapacitated and yet well enough to earn a living.

The London County Council with the help of the *Juvenile Advisory Committee* deals with children who leave the ordinary elementary schools, among them being some of the less serious cases of heart disease. Their method is based on that of the After-Care Association, but as about 50,000 children leave the London elementary schools annually the follow-up system is less complete, despite the efforts of some five to six thousand voluntary visitors, who work under a skeleton service of London County Council officials (L.C.C. Annual Report 1936). Similar juvenile employment committees under the Ministry of Labour have been set up in most of the large industrial areas and render great service to young people leaving school.

One of the weak spots in this otherwise effective scheme has been the hiatus between the school-leaving age of 14 years and the age of 16, when the young person becomes insurable under the National Health Insurance Act. During these years there was no official medical supervision, an omission that was particularly undesirable in the case of rheumatic children with heart affections, and there are many with mild cardiac lesions who leave the ordinary elementary schools at fourteen. A new Act which comes into force on April 4th of this year fills the gap by enabling children leaving school and entering employment to obtain medical benefit and the services of a doctor pending their title to full insurance at the age of sixteen.

The special work of the After-Care Association for juvenile heart disease is confined to London; similar facilities are badly needed in the other large cities of the country. The obvious organisation to give the necessary impetus to this work throughout England is the *Central Council for the Care of Cripples*, a voluntary body of many years' standing who have recently been enriched by a gift of £125,000 from Lord Nuffield. With this money an extensive scheme is on foot for the improvement of treatment, after-care, and provision of suitable employment for young cripples in England and Scotland. It is therefore very regrettable to find that the plan is intended only for orthopædic cases, and that those with cardiac

disorders are to be rigidly excluded. Perhaps those who are to administer the Nuffield Trust may be persuaded to alter their decision.

FACTORIES

Before leaving the industrial aspect of juvenile heart disease a brief consideration should be given to certain innovations embodied in the Factory Act 1937. Under the new Act there will now be facilities for re-examination, and an opportunity of revising the effect of work on an adolescent's health. Factory surgeons will no longer be faced with the dilemma of either giving a certificate of fitness to a doubtful case or of rejecting him altogether, knowing that the latter course would probably result in unregulated employment or shortage of food.

Closer coöperation and continuity of records between the school medical service and the certifying surgeons is also contemplated, and it is to be hoped that the health of the worker will be better safeguarded as a result. Heart cases in particular should benefit and be prevented from undertaking or continuing in work which might prove too arduous. It should certainly be mentioned that some employers provide a first-class medical service of their own. This is to be encouraged, provided there is the proper coöperation between this service and the certifying factory surgeon.

Occupations.—It is important to realise that factory posts do not necessarily entail heavy manual labour, and a good many of my old patients have found the work agreeable and not too strenuous. Others have entered various trades, some sedentary and some involving a certain amount of exercise or standing. Most of my old patients have accomplished this employment without detriment to their health (cf. Moon 1923). Office work and dress-making are popular occupations, and many cardiac cases have received preliminary training for these at school; a number have taken up domestic service; a few are married and have had children of their own. Harris (1937) has shown how essential proper medical attention is for women with heart disease when they become pregnant. Patients who attended my follow-up clinic and required such advice were always directed to hospital departments where they could obtain the right treatment.

The latest details of the further history of the 1000 old rheumatic patients reviewed in my first lecture are given in Table II.

TABLE II—FURTHER HISTORY OF 1000 CASES OF JUVENILE RHEUMATISM

At school	384	Elementary school	252
		P.D. school	96
		Various schools	36
In hospital	5		
At home	61	(15 married, 6 with children)	
At work—			
Factories	80		
Offices	77		
Dress-making	75		
Domestics	35		
Shop assistants	33		
Various trades	101	(Furriers, printers, hairdressers, messengers, packers, laundry maids, &c.)	
At work (unspecified)	26		
Dead	123		
Total	1000		

ECONOMIC CONSIDERATIONS

All the special measures for the benefit of children with heart disease which have been considered involve a certain amount of national expenditure and are, therefore, to a large extent a tax on the resources of healthy members of the community. Impartial consideration of this point, excluding all humanitarian principles, raises the question whether all the time and money spent on the care of these unfortunate people is really worth while. Those concerned with national economy must take this standpoint at times, particularly if they are to look with any favour on a proposed extension of the scheme. Before they are prepared to recommend this, public health authorities naturally want to know the ultimate effect of various existing measures, such as convalescent home treatment, rheumatism clinics, special schools, after-care work, school medical supervision, and conferences for vocational advice. If the net result is merely to ease the later years of a hopeless cardiac cripple or possibly prolong life for a short while under such circumstances, the service rendered could be counted merciful, but is strictly limited in its value to the State. Such sentiments may sound cold and calculating, but it is necessary to approach public health problems in a practical way.

One of the main objects of these lectures has been to investigate this very point, and I believe that the evidence produced not only vindicates the measures already in force against the disease, but gives strong justification for their wider extension. It has been shown, for instance, that juvenile heart disease has a better prognosis than is generally supposed, provided that those who suffer from it receive early prolonged care, and every effort is made to render their rheumatic condition quiescent. Those who have had wide experience of children with heart disease are convinced that a proportion recover completely—estimated at 30 per cent. by Carey Coombs (1924) and 37 per cent. by Morse (1931). In many others the cardiac damage is limited and of no serious consequence.

The fact that rheumatism becomes less dangerous after puberty is in my opinion one of the strongest indications for all the elaborate measures during childhood, which we have just considered. The idea that the various rheumatic schemes already in existence are mostly efforts to prolong the lives of useless invalids is far from the truth. This must be universely recognised if the extension of these public medical services is to receive the support it undoubtedly needs. Although juvenile heart disease can be very crippling, I have attempted to show that it is worth tackling with all the forces at our disposal. There will be disappointments, but the successes will more than counterbalance these, while those who have rheumatic children under their care will have the satisfaction of seeing numbers of them turn into useful citizens.

I should like to take this opportunity of thanking the Invalid Children's Aid Association, and particularly Miss Steggall, for their help in running the follow-up clinic, and also to the nursing staff of the Children's Heart Hospital, West Wickham, for their assistance in this investigation.

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BACTERICIDAL CHANGES INDUCED IN HUMAN BLOOD AND SERUM BY SULPHAMIDO-CHRYSOIDINE AND SULPHANILAMIDE

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Colebrook, Buttle, and O'Meara (1936) showed that sulphanilamide exerted a bactericidal effect on hæmolytic streptococci when added to normal human blood in vitro, whereas no such effect was obtained by the addition of the disodium salt of 4′-sulphamido-phenyl-2-azo-7-acetylamino-1-hydroxynaphthalene 3:6-disulphonic acid (Prontosil soluble, hereafter designated PS in accordance with the nomenclature employed by Colebrook, Purdie, and others 1937). In the blood of mice and rabbits sulphanilamide had very much less effect. The blood of patients under treatment by sulphanilamide and also by the red dyes, the hydrochloride of 4′ sulphamido-2:4-diamino-azobenzol (Prontosil rubrum, hereafter designated sulphamido-chrysoidine, Colebrook, Purdie, and others 1937) and PS in combination, was also shown to develop a considerable bactericidal power against hæmolytic streptococci.

It was suggested by Colebrook, Buttle, and O'Meara that the bactericidal power conferred upon the blood by sulphanilamide might well play an important part in the therapeutic effects obtained with these drugs in human beings. Nitti, Bovet, and Delpierre (1937) and Finklestone-Sayliss, Paine, and Patrick (1937) confirmed the bactericidal activity of sulphanilamide, and several other investigators have conceded at least a bacteriostatic action of the drug (Gay and Clark 1937, Long and Bliss 1937). Recently however Burgers (1937) has stated—without giving any data—that he was unable to confirm the findings of Colebrook, Buttle, and O'Meara. Domagk (1937) also has reported that while some antibacterial effect, "eine gewisse wirkung," could be obtained with "prontosil compounds"—which ones are not specified—in vitro against certain strains of hæmolytic streptococci, almost no such effect could be demonstrated with other strains notwithstanding that they were susceptible to the action of the drugs in the animal body.

Mayer (1937) confronted with this rather conflicting evidence concluded that the antistreptococcal effect of sulphanilamide in vivo was probably not due to any direct action of the drug as such on the microbe, but might be due to the production of some derivative of it in vivo, which had a greater bactericidal action.

In view of the importance of this question in its bearing upon the mode of action of these new drugs, it appears worth while to report such further evidence as has accumulated during the past year. The present paper provides data as to: (1) The bactericidal changes induced in the blood of three streptococcus-infected patients treated by sulphamido-chrysoidine and PS; and three treated by sulphanilamide (reference is made to similar results obtained in seven uninfected cases). (2) The bactericidal effect obtained with normal human blood to which sulphanilamide had been added in vitro, against different strains of hæmolytic streptococci. (3) The parts played by the serum and the cellular constituents respectively in the bactericidal effect obtained with blood containing sulphanilamide.

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BACTERICIDAL CHANGES IN BLOOD OF PATIENTS UNDER TREATMENT

Experimental methods used.—The defibrinated blood of a patient and of a normal control were implanted with graded quantities of a culture of hæmolytic streptococci ("Richards," a Type 3 strain belonging to Group A Lancefield) which had been rendered highly virulent for mice by repeated mouse passage. The implanted samples of blood were incubated in sealed tubes on a rotating drum (Todd 1927) and samples taken at intervals to determine the fate of the streptococci. In a few experiments the implanted bloods were incubated in slide cells (Wright, Colebrook, and Storer 1923) and the number of colonies subsequently determined. Incubation was at 37° C. Estimation of the free sulphanilamide in the blood was kindly done by Dr. Fuller by the method he described (1937).

Patients Treated by Sulphamido-chrysoidine and PS

CASE 1.—Localised uterine infection. Culture showed hæmolytic streptococci Group A in the vaginal swab. Blood and urine cultures sterile. Dosage: 0·5 gramme PS twice daily by injection; 0·6 g. sulphamido-chrysoidine three times daily by mouth. The results of the bactericidal tests are shown in Table I.

CASE 2.—Uterine infection with extra-uterine spread. Culture showed hæmolytic streptococci Group A in the vaginal swab. Blood and urine cultures sterile. Dosage: 0·6 g. sulphamido-chrysoidine three times daily by mouth. The results of the bactericidal tests are shown in Table II.

CASE 3.—Local uterine infection. Cultures showed hæmolytic streptococci Group A in the vaginal swab. Urine and blood cultures sterile. Dosage: 0·5 g. PS twice daily by injection; 0·6 g. sulphamido-chrysoidine three times daily by mouth. The results of the bactericidal tests are shown in Table III.

The blood of Case 1 killed the largest number of streptococci used for the test (850) on the third day of treatment and the blood from Case 2 on the fifth day of treatment 1350 cocci (again the largest number used). The blood of Case 3 gave no bactericidal effect 6 hours after the first dose, but after 24 hours just failed to kill 800 cocci. On the fourth day of treatment the blood killed the largest number of streptococci used (1050), and the serum from the same blood just failed to kill the same number. These results confirm those already reported by Colebrook, Buttle, and O'Meara (1936).

Patients Treated by Sulphanilamide

CASE 4.—Severe local uterine infection with mild septicæmia. Culture showed hæmolytic streptococci Group A in the vaginal swab. Urine culture sterile. Blood culture 1 colony of hæmolytic streptococci in 4 c.cm. of blood. Subsequent blood cultures sterile. Dosage: 1·5 g. sulphanilamide three times daily by mouth. The results of the bactericidal tests are shown in Table IV.

CASE 5.—Moderately severe local uterine infection. Cultures showed hæmolytic streptococci Group A in the vaginal swab. Blood culture sterile; urine culture *Bacterium coli*. Dosage: 1·0 g. sulphanilamide three times daily by mouth. The results of the bactericidal tests are shown in Table V.

TABLES I–VI—ROTATING-TUBE METHOD

I—(CASE 1)

Treatment (PS = prontosil soluble; SC = sulphanilamide chrysoidine; Sulph. = sulphanilamide; rec. = received).	Cocci implanted in 200 c.mm. of blood.	Cocci surviving after 24 hours in 200 c.mm. of— Control blood.	Patient's blood.	Concentration of free sulph. in patient's blood.
First day—				
Before PS & SC ..	25	26×10^6	20×10^6	..
1 hr. after 1st dose	25	26×10^6	20×10^6	1/107,000
Second day—				
3 hrs. after PS & SC (total rec. 4·4 g.).	35	42×10^6	45×10^5	1/85,000
	200	66×10^6	$1·5 \times 10^6$	
Third day—				
5 hrs. after PS & SC (total rec. 7·7 g.).	220	32×10^6	0	1/58,000
	850	30×10^6	0	

II—(CASE 2)

First day—				
Before SC	40	7×10^6	10×10^6	..
Fifth day—				
2 hrs. after SC (total rec. 7·8 g.).	65	15×10^6	0	Not estimated.
	310	21×10^6	0	
	1,350	21×10^6	0	

III—(CASE 3)

First day—				
Before PS & SC ..	54	6×10^6	0	..
	290	8×10^6	4×10^6	
6 hrs. after 1st dose.	16	$1·6 \times 10^6$	100	1/200,000
	180	$3·2 \times 10^6$	Inf.	
Second day—				
3 hrs. after PS & SC (total rec. 3·9 g.).	160	$3·6 \times 10^6$	0	1/100,000
	800	12×10^6	40	
Third day—				
3 hrs. after PS & SC (total rec. 6·7 g.).	235	Inf.	0	1/76,900
	1,175	Inf.	0	
Fourth day—				
3 hrs. after PS & SC (total rec. 9·5 g.).	38	8×10^6	0	1/73,700
	210	Inf.	0	
	1,050	Inf.	0	
Serum from above blood.	38	Inf.	0	1/81,200
	210	Inf.	200	
	1,050	Inf.	300	

IV—(CASE 4)

First day—				
Before sulph. ..	150	120×10^3	17×10^3	..
	720	1×10^6	8×10^6	
1 hr. after	720	1×10^6	0	1/45,000
	3,600	3×10^6	0	
Third day—				
5 hrs. after sulph. (total rec. 10·5 g.).	5,000	24×10^6	0	1/45,000
	10,000	24×10^6	0	
Fifth day—				
1 hr. after sulph. (total rec. 19·5 g.).	17,000	..	0	1/26,000
	451,000	..	0	
Serum from above blood.	650	..	0	..
	17,000	..	150×10^3	
	451,000	..	630×10^3	

V—(CASE 5)

First day—				
Before sulph. ..	100	24×10^6	$1·2 \times 10^6$	..
	570	24×10^6	$1·5 \times 10^6$	
1 hr. after	100	24×10^6	45×10^3	None.
	570	24×10^6	54×10^3	
Second day—				
4 hrs. after sulph. (total rec. 4·0 g.).	1,200	32×10^6	0	1/57,000
	6,000	34×10^6	0	
Third day—				
5 hrs. after sulph. (total rec. 7·0 g.).	1,250	45×10^6	0	1/41,000
	6,250	45×10^6	0	

VI—(CASE 6)

First day—				
Before sulph. ..	300	24×10^6	$2·1 \times 10^3$	..
	7,500	26×10^6	10×10^6	
1 hr. after (total rec. 1·0 g.).	300	24×10^6	0	1/55,000
	7,500	26×10^6	0	
Third day—				
5 hrs. after sulph. (total rec. 7·0 g.).	825	51×10^6	0	1/54,000
	4,125	60×10^6	0	

CASE 6.—Local uterine infection. Cultures showed hæmolytic streptococci Group A in the vaginal swab. Urine and blood cultures sterile. Dosage: 1·0 g. sulphanilamide three times daily by mouth. The results of the bactericidal tests are shown in Table VI.

All three patients developed high bactericidal powers in their bloods. The blood of Case 1 on the fifth day of treatment killed 451,000 cocci (the largest number of cocci used in this test), and the serum from this blood killed 650 cocci and showed a bacteriostatic effect on the larger implants.

In contrast with the results obtained with sulphamido-chrysoidine and PS, two patients under treatment by sulphanilamide (Cases 4 and 6) developed a considerable bactericidal power in their blood within an hour of the first dose.

Similar results were obtained in a series of six uninfected normal women in the puerperium who received sulphanilamide by mouth. These bactericidal results will be published in detail at a later date.

CHANGES IN NORMAL BLOOD WITH SULPHANILAMIDE ADDED IN VITRO

Plan of the experiments.—Appropriate solutions of sulphanilamide were made and one volume of each added to four volumes of freshly defibrinated normal human blood to give the required concentration of the drug. Control blood received a similar addition of saline. The mixtures were implanted with streptococci and treated as described above.

TABLE VII—RESULTS OF BACTERICIDAL TESTS ON NORMAL HUMAN BLOOD TO WHICH SULPHANILAMIDE WAS ADDED IN VITRO: SLIDE-CELL METHOD.

READING AFTER 7 HOURS' INCUBATION

Cocci implanted		505	101	25
Normal blood containing—				
Saline		Inf.	96	22
Sulph.	1/500,000 ..	Inf.	70	4
	1/100,000 ..	0	0	0
	1/50,000 ..	0	0	0
	1/10,000 ..	0	0	0

READING AFTER 24 HOURS' INCUBATION

Normal blood containing—				
Saline		Inf.	Inf.	Inf.
Sulph.	1/500,000 ..	Inf.	Inf.	Inf.
	1/100,000 ..	Inf.	Inf.	Inf.
	1/50,000 ..	Inf.	Inf.	0
	1/10,000 ..	0	0	0

Inf. = uncountable number of colonies. The figure 4 = number of colonies formed.
The contents of cells showing no colonies after 48 hours' incubation were planted into blood-agar plates to show that the cocci were killed and not merely inhibited. In no instance did any growth occur.

Summary of results.—The results obtained by the slide cell method are shown in Table VII. A concentration of sulphanilamide of 1/50,000 in the blood produced some killing power, whilst a concentration of 1/10,000 produced a much greater effect.

The rotating-tube method has proved more satisfactory and the results obtained by this method are shown in Table VIII. The maximum bactericidal effect was obtained with a concentration of sulphanilamide in the blood of 1/16,000, and beyond that concentration the bactericidal power of the blood remained the same. With the lowest concentration

of sulphanilamide tested, 1/128,000, a small bactericidal effect was still seen.

These figures are of interest from the clinical point of view. Estimation of the free sulphanilamide in the blood of a series of nine patients who were given sulphanilamide by mouth (the results in three cases are recorded here in detail in this paper) showed that it was present in concentrations varying from 1/100,000 an hour after the first dose, up to 1/20,000 after 24 hours' treatment. On the average it was found that the concentration of free sulphanilamide in the blood of treated patients was about 1/40,000. At a concentration of 1/40,000 free sulphanilamide in the blood, the blood had in most cases a good bactericidal power, so that from a theoretical point of view a good curative effect could be expected, and from the clinical point of view this curative effect was usually observed.

Table IX shows the bactericidal effect obtained from normal human blood to which sulphanilamide was added in vitro, against different strains of streptococci. Only 2 out of 21 strains were found to be insusceptible to the action of sulphanilamide in vitro (one of these strains belonged to Type 6, the other one was undetermined).

TABLE VIII—RESULTS OF BACTERICIDAL TESTS ON NORMAL HUMAN BLOOD TO WHICH SULPHANILAMIDE WAS ADDED IN VITRO: ROTATING-TUBE METHOD

Cocci implanted		4000	800	180	40
Normal blood containing—Saline		Inf.	Inf.	Inf.	Inf.
Sulph.	1/128,000 ..	Inf.	20×10^3	0	0
	1/64,000 ..	Inf.	0	0	0
	1/32,000 ..	0	0	0	0
	1/16,000 ..	0	0	0	0

LARGER NUMBER OF COCCI IMPLANTED

Cocci implanted		350×10^3	70×10^3	14×10^3	3×10^3
Normal blood containing—Saline		Inf.	Inf.	Inf.	Inf.
Sulph.	1/32,000 ..	Inf.	Inf.	160	0
	1/16,000 ..	Inf.	22×10^3	0	0
	1/8,000 ..	Inf.	25×10^3	0	0
	1/4,000 ..	Inf.	28×10^3	0	0

The figures indicate the number of streptococci surviving in 200 c.mm. of blood after 24 hours.

TABLE IX—RESULTS OF BACTERICIDAL TESTS ON DIFFERENT STRAINS OF HÆMOLYTIC STREPTOCOCCI. (ALL GROUP A LANCEFIELD.)

Strain.	Source.	Type.	Mouse virulence.	Method of testing.	Concentration of sulph.	Result.
1	Puerperal infec.	6	Avirulent.	R.T.	1/10,000	–
2	„	..	Not tested.	„	„	+ + +
3	„	..	„	„	„	+ +
4	Surgical sepsis.	25	„	„	„	+ + +
5	Puerperal infec.	..	Avirulent.	„	„	–
6	„	11	„	„	„	+ + +
7	„	..	Not tested.	„	„	+ + +
8	Surgical sepsis.	..	„	„	„	+ + +
9	Puerperal infec.	3	Avirulent.	„	„	+ + +
10	„	25	„	„	„	+ + +
11	„	..	Not tested.	„	„	+ + +
12	„	..	„	„	„	+ + +
13	„	27	Avirulent.	„	1/8,000	+ + +
14	„	..	„	„	1/16,000	+ + +
15	Erysipelas.	25	Virulent.	„	„	+ + +
16	Puerperal infec.	1	Not tested.	S.C.	1/10,000	+ + +
17	„	6	„	„	„	+ +
18	„	12	„	„	„	+ + +
19	„	9	„	„	„	+ + +
20	„	13	„	„	„	+ + +
21	„	3	Virulent.	R.T.	„	+ + +

R.T. = Rotating tube; S.C. = slide cell.
In the last column – = no bactericidal effect; + + = moderate bactericidal effect; + + + = strong bactericidal effect.
Strains 1–8 were tested by Dr. L. Colebrook, to whom I am indebted for his permission to publish the results.

TABLES X AND XI—RESULTS OF BACTERICIDAL TESTS ON SERUM: CELL MIXTURES

X—SLIDE-CELL METHOD

Cocci implanted ..	3500	700	140	30	Free sulph. in mixtures.
Patient's serum—Patient's cells ..	0	0	0	0	1/30,000
Normal „ ..	0	0	0	0	1/65,000
Normal serum—Patient's cells ..	Inf.	Inf.	Inf.	Inf.	1/250,000
Normal „ ..	Inf.	Inf.	Inf.	Inf.	None.

Inf. = uncountable number of colonies.
0 = no colonies formed.

XI—ROTATING-TUBE METHOD

Cocci implanted ..	1750	330	64	12	Free sulph. in mixtures.
Patient's serum—Patient's cells ..	2×10^3	0	0	0	1/38,500
Normal „ ..	0	0	0	0	1/78,000
Normal serum—Patient's cells ..	36×10^6	40×10^6	60×10^3	0	1/220,000
Normal „ ..	92×10^6	80×10^6	84×10^6	80×10^6	None.

The figures indicate the number of streptococci surviving in 200 c.mm. of reconstituted blood after 24 hours' incubation.

PART PLAYED BY SERUM AND CELLULAR CONSTITUENTS

The following experiments were done to determine whether the bactericidal effect observed in blood to which sulphanilamide had been added in vitro was due to the presence of the drug in the serum or to an increased activity on the part of the leucocytes.

The blood of a patient receiving sulphanilamide and a normal blood were centrifuged and the serum removed. The cells were washed four times in saline and centrifuged. Four mixtures were then prepared:

1. Patient's serum: Patient's cells.
2. „ „: Normal cells.
3. Normal serum: Patient's cells.
4. „ „: Normal cells.

The cell: serum volume was the same with both bloods, and this proportion was maintained in the final reconstituted bloods. The mixtures were implanted with streptococci and incubated at 37° C. in slide cells. The results are shown in Table X.

This experiment was repeated later and the mixtures incubated on the rotating drum. The results are shown in Table XI.

It can be seen in Tables X and XI that a bactericidal effect was only obtained in those reconstituted bloods which contained the patient's serum, indicating that it was the serum containing the free sulphanilamide which was primarily responsible for the bactericidal effect.

In view of this result further experiments were done using serum to which sulphanilamide had been added in vitro.

The procedure was the same as that followed for the in-vitro addition of sulphanilamide to blood, with the substitution of serum for blood.

The results are shown in Table XII. The maximum killing power was obtained with a concentration of sulphanilamide in the serum of 1/8000. Concentrations of 1/32,000 and 1/64,000 gave a very poor bactericidal effect, and at 1/128,000 no killing power was demonstrated.

TABLE XII—RESULTS OF BACTERICIDAL TESTS ON NORMAL HUMAN SERUM TO WHICH SULPHANILAMIDE WAS ADDED IN VITRO: ROTATING-TUBE METHOD

Cocci implanted		3000	600	160	35
Normal serum containing— Saline		Inf.	Inf.	Inf.	Inf.
Sulph.	1/128,000	Inf.	Inf.	Inf.	Inf.
	1/64,000	Inf.	18×10^2	11×10^2	0
	1/32,000	16×10^2	60	0	0
	1/16,000	6,400	0	0	0

HIGHER CONCENTRATIONS OF SULPHANILAMIDE

Cocci implanted		312,500	62,500	12,500	2,300
Normal serum containing— Saline		Inf.	Inf.	Inf.	Inf.
Sulph.	1/16,000	7,000	2,000	1,900	600
	1/8,000	6,000	40	0	0
	1/4,000	2,800	40	0	0

The figures indicate the number of streptococci surviving in 200 c.mm. of serum after 24 hours' incubation.

These results differed in several respects from those obtained when sulphanilamide was added to whole blood in vitro. In the case of whole blood, the maximum effect was obtained with a concentration of sulphanilamide of 1/16,000, although the maximum number of streptococci killed was not as large as in the case of serum. In lower concentrations the blood produced a better bactericidal effect than the serum. In order to compare the results obtained with blood and serum more accurately, an experiment was done using blood and serum taken at the same time. The result is shown in Table XIII.

In concentrations of sulphanilamide of 1/8000 and 1/16,000 the serum killed more cocci than the blood, although the difference was not very large. The bactericidal effect probably depends on two main factors, one being the concentration of sulphanilamide and the other the leucocytes. When the concentration of sulphanilamide is low, the blood kills more cocci than the serum because of the presence of the leucocytes in the blood, the phagocytes in this case playing a relatively important part. When, however, the concentration of sulphanilamide is high, this becomes the important factor and the part played by the leucocytes becomes of less importance. Fuller (unpublished) has shown that sulphanilamide in blood is divided between the serum and the red cells in the ratio of 2 : 3, and therefore if the concentration of the sulphanilamide in the blood is 1/16,000 the concentration of the drug in the serum of that blood will only be 1/20,000. This adsorption of the sulphanilamide to the red cells probably explains the slight superiority of the serum over the blood in high concentrations of sulphanilamide.

TABLE XIII—RESULTS OF BACTERICIDAL TESTS ON NORMAL HUMAN BLOOD AND SERUM TAKEN AT THE SAME TIME, TO WHICH SULPHANILAMIDE WAS ADDED IN VITRO: ROTATING-TUBE METHOD

Cocci implanted		175,000	35,000	7,000
Normal blood containing— Saline		Inf.	Inf.	Inf.
Sulph.	1/16,000	Inf.	2,600	1,280
	1/8,000	Inf.	1,560	500
Normal serum containing— Saline		Inf.	Inf.	Inf.
Sulph.	1/16,000	1,240	560	0
	1/8,000	260	0	0

The figures indicate the number of streptococci surviving in 200 c.mm. after 24 hours' incubation.

DISCUSSION

In attempting to explain the therapeutic effect of the red prontosils and sulphanilamide two theories have been predominant: the one that this effect was chiefly due to a direct action of sulphanilamide upon the coccus (Colebrook, Buttle, and O'Meara 1936, Nitti, Bovet, and Delpierre 1937); the other that any such action was only ancillary to the operation of the cellular defence mechanism of the body (Gay and Clark 1937, McKinley and Mellon 1937, Long and Bliss 1937, Osgood and Brownlee 1938).

On the evidence available at present it would not be profitable to discuss these alternatives at length, and certainly it would be premature to assert that one or the other affords a complete explanation of the therapeutic effects obtained. The experiments here recorded provide somewhat more adequate data than has been presented hitherto as to the bactericidal and bacteriostatic effects of sulphanilamide in vitro, and they make it clear that these effects are to a large extent independent of the activity of the phagocytes. They also show that the large majority of the strains of hæmolytic streptococci (Group A Lancefield) so far tested are susceptible to the bactericidal or bacteriostatic action of sulphanilamide. This latter finding is at variance with the experience of Domagk (1937), but the reason for this discrepancy is not difficult to detect. Domagk's experiments, in which he found only two out of seven strains of hæmolytic streptococci susceptible to sulphanilamide in vitro, were carried out with rabbit's blood, and he used only one rather large implant of streptococci (one drop of a 24-hour culture diluted 100-fold). It was pointed out by Colebrook, Buttle, and O'Meara that the bactericidal and bacteriostatic effect of sulphanilamide was very much smaller with the blood of rabbits and mice than with human or monkey blood, and Colebrook has frequently found that a bactericidal or bacteriostatic effect may be overlooked when a very large implant of streptococci is employed, while it is detected with a smaller test dose. The present paper also offers examples of this.

With regard to the minimum effective concentration of sulphanilamide in the blood, Osgood and Brownlee (1938) consider that 1/100,000 would be adequate. The results of the in-vitro addition of sulphanilamide to human blood and serum recorded in this paper suggest that a minimum concentration of 1/60,000 is desirable, and that concentrations even higher than this would probably produce more certain clinical effects.

SUMMARY

1. A considerable bactericidal power against hæmolytic streptococci was demonstrated in the blood of 12 patients. No such bactericidal power was present in the blood of normal untreated controls. Of 3 patients under treatment by sulphamido-chrysoidine and PS 2 were studied in detail. In these the killing power was present in one on the second day and in the other on the third day of treatment. Another 9 patients were under treatment by sulphanilamide. In contrast with the 3 patients above, 5 of the 9 developed a killing power in their blood within an hour of the first dose. In no instance when repeated tests were done during treatment was there a failure to demonstrate a bactericidal effect.

2. The addition of sulphanilamide to normal human blood showed that the maximum bactericidal power was obtained with a concentration of 1/16,000, although concentrations as low as 1/64,000 gave good results. These figures agree very closely with those obtained from patients who received the drug by mouth, when it was found that a good bactericidal effect was obtained from all bloods containing 1/60,000 free sulphanilamide or more. A series of 21 strains of hæmolytic streptococci was tested against normal human blood to which sulphanilamide had been added in vitro. Only 2 of these strains were insusceptible to the action of sulphanilamide, and both came from human infections that failed to respond clinically to the administration of sulphanilamide.

3. Experiments are recorded which indicate that it was the serum containing free sulphanilamide which was primarily responsible for the killing power which the blood of patients receiving sulphanilamide developed, and which could be induced in normal human blood by the addition to it of sulphanilamide.

4. A considerable bactericidal power was demonstrated in normal human serum to which sulphanilamide had been added in vitro.

I acknowledge with grateful thanks Dr. L. Colebrook's constant interest and advice in this work. My thanks are also due to Dr. D. Colebrook for her determinations of the type of the strains of hæmolytic streptococci recorded in Table IX, and to Dr. Fuller for his estimations of free sulphanilamide in the blood.

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SUDDEN DEATH FROM VON GIERKE'S (GLYCOGEN) DISEASE

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SOME 40 cases of this disease have now been reported from either a clinical or a pathological aspect since the condition was first recognised as an entity by von Gierke in 1929. None, however, has taken the form of a case of sudden death requiring a medico-legal examination, and there is as yet no description of the disease as a cause of unexpected death in youth. One of us (E. G.) examined a case of sudden death in a breast-fed infant of three months, in which the principal finding was a remarkable enlargement of the heart, and which at the time was thought to be, in all probability, a case of von Gierke's disease. Within a few weeks K. S. made a similar examination on a schoolboy of 11 who had suddenly collapsed and died in the street; on this occasion, owing largely to facilities for immediate laboratory examination, an equally remarkable cardiac enlargement, also the principal finding, was proven beyond question to be due to glycogen disease.

Since hypoglycæmia is one of the most constant features of the disease it might be expected that serious symptoms—drowsiness, incoördination, convulsions, or collapse—should be somewhat frequent, and sudden death a possibility; but this has not been so. Indeed symptoms of hypoglycæmia have been uncommon, and in this respect the two cases reported here provide no new departure. Each death appears to have been due to cardiac muscle failure, and until fatal collapse took place both subjects had enjoyed quite good health; an attack of jaundice, occurring 10 months before death and lasting two weeks, and in the older of the two subjects only, was the sole evidence of ill health of any kind before sudden death; it was, as is now clear, a herald of the disease.

It must be made perfectly clear that of the two, only the schoolboy gave unquestionable proof of the nature of the disease; the post-mortem appearances were so pronouncedly like those of von Gierke's disease that immediate histochemical tests were made on the heart muscle, liver, and kidney and confirmation obtained. The case of the infant is put forward only as one of probable von Gierke's disease in order to draw attention to the possibility in cases that hitherto may have been regarded as examples of "cardiomegaly" without apparent explanation. In spite of the reputed stability of the glycogen accumulations in the disease examination should not be delayed. As it was seen in a district which was then without laboratory facilities for medico-legal work, and being only months old and showing none of the pronounced features of the schoolboy, the infant was at the time regarded as one of some unusual developmental or metabolic cardiomegaly; changes were apparently confined to the heart, and this organ alone was preserved for further examination. When this took place some days later no glycogen was to be demonstrated, but the structural features of the heart muscle were identical with those of glycogen disease. In view

of these facts the case of the schoolboy with clear proven von Gierke changes will be described first.

CASE REPORTS

It will facilitate reference to recognised features of the disease if they are summarised before the details of the two cases are given. The disease is characterised as follows: (1) it occurs in youth; (2) it is an isolated phenomenon or may affect two or more sibs. There is also (3) infantilism, and obesity; (4) smooth enlargement of the liver, heart muscle, and kidney, due to glycogen infiltration; and (5) occasional transient attacks of jaundice.

CASE 1.—The schoolboy, an only child, was examined 16 hours after death on Oct. 15th, 1937, in a public mortuary unequipped with cold storage. He had been a perfectly healthy boy until he had an attack of jaundice in December, 1936. No definite diagnosis had been made, and the condition cleared away in two weeks. He was then well until the day of his death. He had attended school in the morning, returned home for lunch shortly after 12 noon, had made no complaint of any kind, eating a good meal, and had gone back to school at about 1.30 P.M. for the afternoon session. At 4.30 P.M., a few minutes after leaving school, he was playing in the street when he suddenly complained of "feeling faint," and at once collapsed, apparently dead. A doctor who arrived but a few minutes later certified death and reported the facts to the coroner. The boy was said to have been "an average schoolboy," as active as his fellows without complaint, and taking part normally in games. He was neither "forward" nor "backward" in mental ability and had never given cause for any special attention.

Post-mortem examination.—Stature normal for age, but build slim. Height 4 ft. 7½ in. Pale, but without jaundice or other marks. No evidence of infantilism. No puberty changes. No abnormal distribution of fat. No abdominal protrusion when supine. Internally, the changes were confined to the heart and to the liver, except for evidence of terminal heart failure. Pericardial sac normal and without excess fluid. Heart very greatly enlarged, mainly in the wall of the left ventricle and interventricular septum. Weight 384 grammes (13½ oz.), that is, the weight of an adult heart on the verge of some hypertrophy. On section the most remarkable thickening of the wall of the left ventricle was found, greatest in the septum, which was 2·2–2·4 cm. in thickness (nearly 1 in.) and of pale yellow colour, soft, moist, and bulging slightly on the plane of section (Fig. 1). Similar changes were present to a lesser degree in the rest of the left ventricular wall: thickening was eccentric, the posterior wall being 1·2–1·4 cm. thick (½ in.) and the anterior wall 1·8–2·0 cm. thick (¾ in.). The wall of the right ventricle was very slightly thickened throughout, the muscle showing the same pale yellow discoloration. Both ventricles were slightly dilated. The consistency of their muscular walls was more like that of amyloid, in its firm unresilient feel and lack of mobility, than that of a simple but firm hyperplasia. The auricular musculature appeared normal, and the heart bore no other abnormalities of any kind. The coronary vasculature was, in dimensions, adapted to the increased size of the heart. The liver was not appreciably increased in size, but showed an increase of one-seventh in weight over the normal for the age. It was of normal outline, with sharp edges and of good colour; it was not in any sense yellowed or otherwise discoloured, and also had a normal consistency. Both kidneys were normal in appearance and showed no increase in weight. The spleen also was normal. All other organs and tissues, and the several endocrine organs in particular, appeared perfectly healthy.

Microscopical examination.—Material from the ventricular septum examined just over an hour later, fresh, and also after a further two hours alcohol or formalin fixation, bore the appearances of heart-muscle fibres of gargantuan dimensions, with imperfect transverse and longitudinal striations, due to a pale foaminess of the muscle shown by Best's staining method to be due to the presence of innumerable globular accumulations of glycogen (Fig. 2). The parenchyma of the liver showed similar changes, though much less marked. None was found in the kidneys.

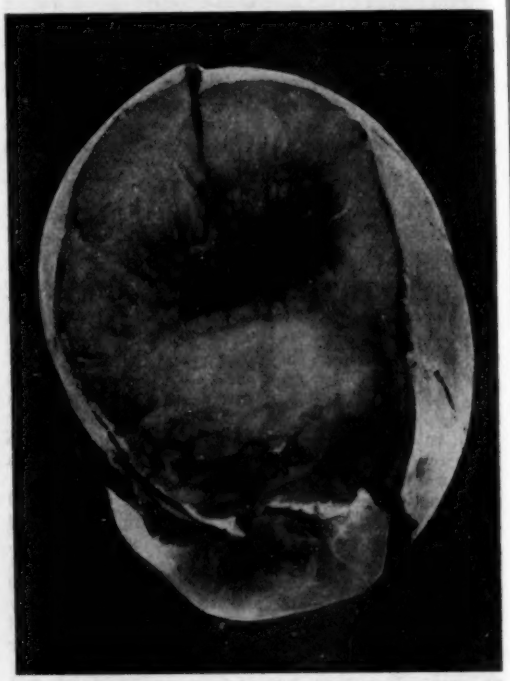

FIG. 1 (Case 1).—Heart, cut at the junction of middle and lower thirds of the ventricles and seen on the surface of section.

The Table of measurements of Case 1 shows the striking feature of this case of von Gierke's disease. As reflected by the comparative increase in weight, the disease has affected by far the most seriously the heart. The heart was more than three times its normal weight for the age, the liver being increased by no more than one-seventh and no other organ being affected. The Table also includes the measurements of weight taken in the second case.

—	Organ weights.							
	Heart.	Lungs.		Spleen.	Liver.	Kidneys.		Brain.
NORMAL—		Rt.	Lt.			Rt.	Lt.	
body-length, 135 cm. ..	122 g.	201 g.	190 g.	87 g.	909 g.	94 g.	95 g.	1320 g.
CASE 1 (aged 11) 139 cm. ..	**384 g.**	205 g.	210 g.	85 g.	**1040 g.**	92 g.	96 g.	1325 g.
NORMAL—								
body-weight, 11 lbs.	2¾ g.	3½ g.	3 g.	¼ oz.	5¼ oz.	¼ oz.	¼ oz.	18 oz.
CASE 2 (3 mths.) 16 lb. ..	**54 g.**	4·0 g.	4·5 g.	¼ oz.	6 oz.	1 oz.	1 oz.	21 oz.

Only heart and lungs retained for accurate weight in g. from Case 2. Other weights in this case recorded at P.M. in ounces.
Average normal figures taken from Cappoletta and Wolbach's tables (1933).

CASE 2.—An infant 3 months old was examined (E. G.) 33 hours after death on Feb. 6th, 1937, also without cold storage. He was perfectly healthy at birth, was breast-fed, and developed "wonderfully well." On Feb. 5th, 1937, the mother was worried because she thought he was breathing too fast, and called in a doctor. He found the breathing natural, the pulse and temperature normal, and he was apparently perfectly well. The father arrived home at 3 A.M. on Feb. 6th, and found the child, as he thought, dying. Death did, in fact, take place before the doctor arrived, which was almost immediately.

Post-mortem examination.—A healthy well-developed child of 16 lb., without marks or discoloration of any kind other than post-mortem lividity. A trace of yellow frothy fluid was present at the nose and mouth. No abdominal protrusion noted. No defects of skeletal development. Apart from terminal congestion of the brain and its covering meninges, of the lungs, with slight œdema, and of the liver and spleen—evidence in sum of terminal heart failure on both right and left sides—abnormalities were confined to the heart. Pericardial sac healthy and without excess of fluid. Heart weight 54 grammes as compared with 23 g. average normal weight at the age. All cavities were distended to the full with dark fluid blood, and the muscular wall of the left ventricle including the septum interventriculorum showed a remarkable thickening, with prominent columnæ carneæ and appreciable pallor of irregular distribution most marked in the upper parts. The endocardium was unusually pale and opaque. This thickening of the ventricular and septal wall was not regular, being appreciably greater in the septum; after fixation in formol saline (10 per cent.) the measurements of the walls varied from 0·8 to 1·3 cm. The foramen ovale was normal for the age, having a flap valve patency without functional deficiency of any kind. The ductus arteriosus was closed, and there was no stenosis of the main vessels. All valves

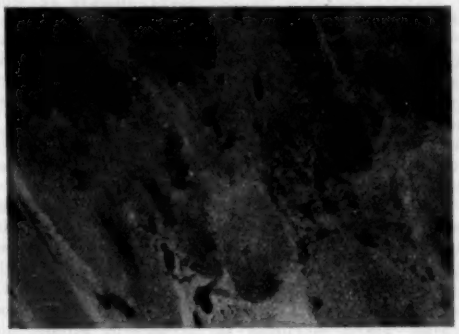

FIG. 2 (Case 1).—Section of muscle of interventricular septum showing coarse and fine intracellular granules of glycogen, the latter arranged with the cross striations. Stained with Best's carmine. (× 400.)

were normal. The interventricular septum was without defect. Examination of all other organs and tissues revealed no abnormalities other than terminal congestion. The endocrine organs in particular were normal for the age. It was remarked at the time that the coronary arterial supply to the heart had not developed pari passu with the increase in weight of the organ; that irrespective of the cause of the cardiomegaly the heart appeared to have outgrown its blood-supply.

Microscopical examination.—The examination of several parts of the affected heart muscle did not result in the demonstration of glycogen. Best's method was used, after fixation of approximately three days in formol saline (10 per cent.). Nevertheless the structural changes were identical with those already described in the first case. The muscle-fibres were of the same gargantuan dimensions, had the same imperfect transverse and longitudinal striations, and showed an identical "foaminess" of the protoplasm. It was felt at once that this cardiomegaly was of glycogenic origin, but that, already even, too much time had elapsed to enable a histochemical demonstration of the material to be made; that glycolysis had taken place. The condition had, at post-mortem, appeared to be so confined to the heart muscle that examinations of other tissues were not made.

According to Ellis and Payne (1936) in one of the most full descriptions of this disease, it is an essential character of the condition that there should be an abnormal stability of the glycogen, and whereas this is undoubtedly so, the knowledge should not lull one into any delay in making histo-chemical examinations of affected tissues, for fear of losing the sole basis of identification of the disease. It was found that microscopical examinations of the heart muscle from the proven case of the disease taken from periods of 2 days onwards provided increasing difficulty in the recognition of glycogen; the characteristic foaminess of the protoplasm remained, but its affinity for Best's carmine decreased rapidly until on the fourth day it no longer became possible to demonstrate this material. It is precisely because of this observation that the second case was held to be one of von Gierke's disease in spite of the fact that no glycogen was demonstrated.

DISCUSSION

Several examples of cardiomegaly, occurring in the disease, have previously been described—in particular, with histological descriptions, by Pompe (1933), and by Unshelm (1934), but there has as yet been no description of the disease from a medico-legal standpoint as a cause of sudden death.

In neither of the present cases was there any clinical evidence of serious disease; the schoolboy had had an attack of jaundice not uncommon to the condition, and in all probability a form of true catarrhal jaundice, but had recovered what was apparently a condition of perfectly good health for at least nine months before his death. Neither child showed any retardation of growth, and this is the more remarkable because this retardation is now regarded as more probably due to a profound dysfunction of any one organ than to an endocrine disorder. There has been no shred of proof as yet that it is an endocrine disease. It might be thought, in two cases such as these where the organ most profoundly affected was the heart itself, that growth would have been most likely to have been retarded were this a proper explanation of its occurrence.

In each case there was no doubt whatever about the cause of death; the heart muscle alone was seriously diseased. Failure in each case was quite sudden and unexpected, and it is to record this type of case, with its medico-legal significance, that we add to the small amount of published work on the disease.

We are indebted to Dr. P. B. Skeels, coroner for metropolitan Essex, and Mr. G. Wills Taylor, coroner for West Surrey, for permission to use the facts relating to these two cases.

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THE CLASSIFICATION OF THE PNEUMONIAS

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Osler (1906) defined lobar pneumonia as an infection characterised by inflammation of the lungs, toxæmia of varying intensity, and a fever that usually terminates by crisis. It is included in the section dealing with acute specific diseases, whereas broncho-pneumonia is described in the section of diseases of the lungs and is defined as an inflammation of the terminal bronchus and the air vesicles which make up the pulmonary lobule. Davidson (1935) considers it wrong to classify lobar pneumonia with the infectious diseases and broncho-pneumonia with diseases of the lung. He points out that in broncho-pneumonia the inflammation is not confined to the lobule and that the word "broncho" is superfluous because the bronchi are involved in all forms of pneumonia.

In hospital practice one cannot help being struck by the comparative rarity of pneumonia starting suddenly and ending by crisis and the frequency of some acute or subacute pulmonary infection the course of which does not conform to text-book type of either lobar or broncho-pneumonia.

Now some of these cases are simple bronchitis in which the smaller bronchi and certainly the alveoli escape, but in an appreciable number the lung tissue is involved and if by pneumonia one means inflammation of the lung then these cases must be regarded as pneumonia.

ACUTE PNEUMONIA

The so-called typical pneumonia which begins suddenly and ends by crisis may be compared with the rare form of acute tuberculosis known as pneumonic phthisis. In this condition an area, and sometimes a large area, of the lung suddenly becomes solid, the alveoli become filled with leucocytes and exudate and although resolution, if it occurs at all, is by lysis the onset of the disease can rarely be distinguished from ordinary lobar pneumonia. It has been suggested that pneumonic phthisis is an allergic reaction around a tuberculous focus in the lung and certainly similar focal reactions have been produced by the injudicious use of tuberculin.

These tuberculous pneumonias may be extensive and rapidly fatal but they vary in severity and some are mild with few symptoms and ending with complete resolution. Sometimes the inflammatory zone resolves but leaves a core of active tuberculosis which may spread locally and cause the ordinary form of caseous or fibrocaseous tuberculosis or which may itself heal leaving only a fibroid or calcareous scar. Is it not possible that the ordinary lobar pneumonia is an allergic reaction comparable to the tuberculous form? In both cases the condition varies in severity from one of extreme toxæmia to one in which the patient shows no symptoms of toxæmia at all.

BRONCHOGENIC PNEUMONIA

The so-called broncho-pneumonia is different not because there is associated bronchitis, which is invariably present also with lobar pneumonia, but because the infection spreads through the bronchi. Thus in tuberculous cases broncho-pneumonia often results from hæmoptysis, the blood carrying the infection through the bronchial tubes. In cases of tuberculous cavities it is sometimes possible to trace the bronchogenic spread of the infection and a terminal tuberculous broncho-pneumonia is a common cause of death. After thoracoplasty the risk of a broncho-pneumonia is much reduced even if the cavities are not closed, because, as Jacobaeus (1936) has shown, the effect of the operation is to prevent cough from affecting the treated lung, so that sputum cannot be dispelled. In non-tuberculous cases spread takes place through the bronchial tubes in the same way, thus it may follow spread of bronchitis to the smaller tubes as may often be seen in cases of influenza or measles. It may follow aspiration of foreign bodies into the bronchi, an uncommon but well-known cause being vomiting during anæsthesia when the vomit enters the bronchial tubes.

SECONDARY PNEUMONIA

Although classical cases of lobar or broncho-pneumonia occur it is far more common in practice to find one of the atypical types some of which are now known as pneumonitis, although this word has the same meaning as pneumonia—namely, an inflammatory condition in the lung.

It is common for a patient, usually a child but sometimes an adult, to come to the out-patient department of a hospital with a temperature of 103° or 104° F., with cough, pain, and a shower of moist sounds audible at the base of one lung, and yet twenty-four hours after admission the temperature has become normal and except for a little cough and possibly a few crepitations the patient has recovered. In many of these cases I think the cause is a plug of mucus producing an area of collapse with an inflammatory reaction, and what is this if not pneumonia? When the mucus is dislodged the lung is aerated and the inflammation quickly subsides. The same result follows when the sudden blocking of a bronchus by carcinoma leads to inflammatory or pneumonic reaction around the collapsed area. Later when the growth ulcerates and opens up the bronchus the acute condition subsides and the patient appears better. I have frequently seen cases of carcinoma of lung in which the first manifestation was an acute illness called, and rightly called, pneumonia.

An area of inflammation of the surrounding lung tissue (pneumonia or pneumonitis) may result from the breaking down of a tumour, or from an abscess or embolus. It may occur in connexion with bronchiectasis, actinomycosis, or other gross disease of the bronchi or lungs. The point of clinical importance is that these atypical or secondary pneumonias may lead to the same serious complications which sometimes follow the so-called lobar or broncho-pneumonias. Of these empyema and abscess of lung are the most important. It is true, however, that apart from these complications the patient rarely suffers from much toxæmia, the illness is not severe, and recovery is the rule. The condition is often long drawn out so that many weeks or even months may occur before recovery is complete.

SUBACUTE AND CHRONIC PNEUMONIA

Scadding (1936, 1937) has described a chronic form of pneumonia, often ending fatally, in which fibrosis occurs during the course of the illness as in tuberculosis. In his cases, however, autopsy showed that the condition was non-tuberculous, although during life the radiological findings closely resembled the mottling of tuberculosis. The actual condition was a simple pneumonia in various stages of evolution, early consolidation, resolving consolidation, organisa-

tion, and suppuration leading to small abscesses. It would appear that in this type of pneumonia resolution might occur at any stage and either be complete or leave a varying amount of fibrosis. Cases of this type in which resolution occurs within a few weeks may be called subacute, and Scadding has described them under the title of disseminated focal pneumonia. The origin of these chronic pneumonias is unknown, but they may occur when the virulence of the infecting organisms and the resistance of the patient are such that the one is insufficient to produce an acute pneumonia and the other insufficient completely to overcome the infection.

The bacteriology of the condition is important both in the acute and chronic case, but it is well known that in every series of cases due to any given organism there are mild, medium, and severe cases. It is not denied that prognosis and the course of the disease do depend to a large extent on the organism which causes the pneumonia, be it the tubercle bacillus, streptococcus, staphylococcus, and if the pneumococcus on the particular type. At the same time every case of tuberculous pneumonia does not run the same course or end in the same way and this applies equally to pneumonias caused by any other organism. All types, however, have in common the danger of the same complications, the most serious of which are empyema and abscess.

ILLUSTRATIVE CASES

The following cases illustrate pneumonia secondary (1) to embolus, (2) to blocked bronchus, (3) to extension from a growth, (4) to thrombosis, and (5) a subacute pneumonia.

(1) *Pneumonia secondary to embolus.*—(*a*) A woman of 26 developed slight pain in the left side of the chest a fortnight after childbirth. She had no cough or other symptom and the pain lasted less than 36 hours. Two days later she gradually began to become febrile and a few crepitations were heard over the base of the left lung where she had had the pain. Later this developed into signs of consolidation, she began to cough, and spat up rusty sputum. After ten days the temperature began to fall but never really became settled and usually rose to 99° F. in the evening. About four weeks after the onset of the illness an effusion was diagnosed; a sample showed it to be thin, cloudy liquid, this was aspirated but eventually became thick pus. Drainage was performed but eventually she died.

(*b*) Eight days after an operation for hernia a man of 60 had pain on the right side of the chest and the temperature began to rise. At first there were no signs in the chest, but a fortnight later some dullness was found and 16 oz. of cloudy fluid were aspirated from the right base. The cells present were mostly polymorphonuclear and the fluid was sterile. He became extremely ill, with heavy sweating and rapid wasting; the evening temperature was 102° F. There was a considerable amount of sputum but no tubercle bacilli were found. Some days later the percussion note on the left side was dull and a sample of fluid was taken from this side and was clear. Another sample from the right side at that time was more cloudy and on standing over night the test-tube showed about one-tenth pus. It was thought that an empyema would develop and require operation, but the patient made a steady though slow recovery.

(2) *Pneumonia secondary to blocked bronchus.*—The patient had pulmonary tuberculosis with radiological evidence of a cavity in the lower zone of the left lung. A pneumothorax was induced and it was decided to try and block the bronchus leading to the cavity by the method described by Brooks (1938). A balloon was introduced into the bronchus and dilated and the corresponding part of the lung collapsed. The next day the patient had a temperature which persisted for a few days and then settled. This febrile reaction was considered due to a local area of inflammation which quickly settled and left the lung collapsed. It is uncommon in these cases for this pneumonic reaction to take place, but is frequently seen when a bronchus suddenly becomes collapsed by carcinoma.

(3) *Pneumonia secondary to extension from a growth.* A man of 55 developed a cough and signs of bronchitis at the end of October. He kept on at work for three weeks when he consulted his doctor. He was found to have signs of congestion at the base of the right lung and a temperature of 101° F. Radiography showed an opacity over this area. The temperature persisted for a fortnight then gradually fell but later rose to 100°–101° and signs of fluid at the right base were found. On Dec. 6th a sample of cloudy fluid was removed from the right pleural cavity and on examination it was found to contain *Streptococcus hæmolyticus*. It was decided to aspirate until the fluid became frank pus and then drain. After the second aspiration, however, no fluid was found and a pleural rub could be heard. He became increasingly ill and subsequent radiography showed evidence of a growth spreading in the lung tissue and he eventually died from carcinoma.

(4) *Pneumonia secondary to thrombosis.*—On Jan. 25th, 1934, a man of 37 coughed up a little blood. This continued and so on Jan. 30th a radiogram of the chest was taken but it showed nothing wrong with the heart or lungs. On physical examination a few fine crepitations were heard at the left base, but no other signs were found in the chest, throat, or larynx. He complained of slight pain in the left axilla, but otherwise felt well and the temperature was normal. On Feb. 5th he had a sudden pain over the base of the right lung and the temperature rose to 101° F. He coughed up small clots of bright blood. There was now dullness at the right base and many coarse crepitations were heard on auscultation. A radiogram taken on the next day showed a dense opacity at the right base suggesting collapsed lung. It was thought that the original hæmoptysis was due to carcinoma of lung and that the acute pain and collapse of lung resulted from sudden blocking of a bronchus. Radiography after lipiodol, however, showed no blocked bronchus and no signs of growth were seen on bronchoscopy. The temperature persisted for a fortnight then gradually fell to normal and the physical signs also gradually cleared. A radiogram taken on April 11th, 1934, showed that the opacity at the right base had completely disappeared and nothing abnormal was seen. On Feb. 28th, just as the signs in the chest were clearing and the temperature had reached normal, he developed a right femoral thrombosis. The possibility that the case was one of thrombo-phlebitis migrans was now considered. This would account for the original hæmoptysis without radiographic signs, for the sudden pain on the opposite side, the hæmoptysis and subsequent pneumonic area, and finally for the femoral thrombosis.

(5) *Subacute pneumonia.*—A man of 31 began to run a slight evening temperature whilst on a holiday abroad. On his return on August 4th he saw his doctor who found no physical signs but the temperature was 101° F., pulse 76, tongue dry and coated. A slight cough developed and sputum in which tubercle bacilli were not found. He looked toxic and ill. Typhoid was suspected but tests for typhoid, paratyphoid, and abortus fevers were negative. In the third week the temperature fell, the tongue cleared, and he felt much better, but a week later the temperature again rose for four days and then once more became normal. A few days later, however, he developed pain in the left side of the chest and a pleural rub was heard. This was the first physical sign that had been discovered. On Sept. 21st his general condition was good and he said he felt well in himself but had a slight ache on the left side. On examination medium crepitations and bronchovesicular breath sounds were heard at the base of the left mid-zone. A radiogram taken at this time

showed a diffuse area of opacity in the left mid-zone extending from the root to the periphery. The temperature was swinging between 101° and 99° F. The pulse was 76–86. The whole of the right basal zone showed diminished translucency suggesting an area of consolidation almost resolved. The temperature gradually settled, was normal by Oct. 12th, and he made an uninterrupted recovery.

SUMMARY AND CONCLUSION

These few cases have been chosen to illustrate the inflammatory condition of the lung which so frequently occurs apart from the so-called lobar or bronchopneumonia. Cases of chronic pneumonia have been described by Scadding. I think all these cases should be grouped as pneumonia and it seems unnecessary to introduce the word pneumonitis unless all cases are called pneumonitis and the word pneumonia is dropped.

I should suggest the following classification:—

1. Acute pneumonia—the text-book lobar pneumonia which it is suggested may be an allergic condition.
2. Bronchogenic pneumonia in which the inflammation spreads by the bronchi.
3. Secondary pneumonia.
4. Subacute or chronic pneumonia.

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THROMBOSIS OF CENTRAL VEIN OF RETINA TREATED WITH HEPARIN*

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RECENTLY pure heparin was made available. As could be expected from earlier literature it proved non-toxic and could be applied for clinical experiments. Several attempts have been made to prevent venous thrombosis with injections of heparin. To our knowledge the following case is the first one in which heparin has been used for the treatment of an already developed thrombosis in man.

Hedenius and Wilander (1936), in a preliminary paper, showed the non-toxicity of pure heparin, even if given in repeated doses intravenously in man, and Hedenius (1936, 1937) has suggested giving heparin to the donor in blood transfusions. The lack of toxicity is clearly demonstrated in the subject of the present article in which a patient has been submitted to a prolonged treatment of over a week. Crafoord (1937) used this preparation post-operatively in a series of cases to prevent thrombosis. He found that the amount of heparin necessary to produce a certain prolongation of the coagulation time before operation must be considerably increased in the 24 hours after an operation. This indicates that there is an excess of thrombokinase in the blood shortly after operation, which can be counteracted by means of heparin. The Toronto workers, Murray, Jaques, Perrett, and Best (1937), prove the usefulness of heparin experimentally in animals. The tendency to the formation of thrombi in injured blood-vessels was found to be strongly decreased during treatment with heparin. They have also applied their findings clinically by recommending heparin treatment particularly in connexion with operations on blood-vessels.

From the recent findings of Jorpes, Holmgren, and Wilander (1937) that heparin is produced in the mast cells of Ehrlich, which are mainly localised to the walls and the neighbourhood of the blood-vessels, it is evident that heparin assists in keeping the blood fluid. Therefore treatment with heparin seems to be indicated in many cases, where there is an undesirable tendency to the formation of fibrin—e.g., in order to counteract the growth of thrombi in veins and arteries, and to prevent the formation of adhesions of the serous membranes or the organisation of hæmorrhages in the vitreous body of the eye. It is thus evident that a new field of research has been opened, in which valuable results may be expected within many branches of practical medicine. In the following case we were able to watch the gradual return of vision in an eye with a thrombosis of the central vein of the retina, after treatment with heparin.

CASE REPORT

A hospital nurse, aged 52, apparently in the best of health, became aware of a sudden dimness of her right eye at about 5 P.M. on Sept. 30th, 1937. At the time she was out cycling, but was not at all exhausted. When she resumed her work at the hospital the following day the presence of a venous stasis and hæmorrhages in the right retina was established.

On examination.—Temperature normal. Sedimentation-rate 11 mm. per hour. Heart: no subjective or objective signs of disease; blood pressure 120/65 mm. Hg. Urine normal; no other venous thromboses. She had suffered from slight nasal catarrh and "grinding" headaches on the left side (not on the right), but an examination of the nose disclosed nothing indicating an affection of the accessory cavities. (The white-cell blood picture was normal on Oct. 7th). On the same day (Oct. 1st) at 6 P.M., 25 hours after the symptoms appearing, the local condition was as follows (K. G. P.). Right eye: external parts normal; pupil round, the same size as the left one; normal reaction; papilla somewhat œdematous and hyperæmic, veins dilated, arteries narrow; a small number of slight hæmorrhages in the vicinity of the papilla and in the macula, and scattered, small, round or irregular, intensely red hæmorrhages, mostly along the vessels far into the periphery; tension 13 mm. Hg; vision barely 0·2. Left eye quite normal; tension 13; vision = 1 (emmetropia).

On the basis of the diagnosis thrombus in the main trunk of the right central vein and the consequent very doubtful prognosis, which will be further discussed below, the following treatment was given (N. H.): (1) The patient was sent to bed. (2) Prontosil was given. This would be effective only if the thrombosis was due to a bacterial infection which, however, could not be determined—consequently its effect cannot be estimated. (3) Heparin was injected for the reasons discussed above.

Treatment.—The patient was given intravenous injections of heparin. We used a 5 per cent. solution of standard potency (Jorpes and others 1937) supplied by Vitrum of Stockholm. The first injection was given on Oct. 2nd at 10 A.M., 41 hours after the appearance of the symptoms. The dose was repeated after 4 hours, but after another 4 hours it was increased to 1·66 mg. per kilogramme, and was then repeated every fourth hour, except during sleep. She also had 5 c.cm. of prontosil a day. On the 4th and 5th all medication was discontinued, only because there was a certain hesitation as regards the

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risks. When, however, on the 5th there was an improvement of vision (from 0·2 to 0·4) we started anew, the treatment being finally concluded on Oct. 13th. We gave prontosil in 3 doses daily, of 2 tablets each until Oct. 8th and then 1 tablet.

Thus 3–4 daily doses of heparin of 1·66 mg. per kg. body-weight were given during a period of about 10 days without any perceptible inconveniences. *Progress* of the eye symptoms was as follows (K. G. P.): Oct. 5th: Pupil as before, papillary swelling increased, and the stasis more pronounced, showing more dilated veins and very narrow arteries. Hæmorrhages around the papilla increased, two large ones being seen above and to the nasal side. Tension, on palpation, normal. Vision 0·4–0·5. (Oct. 7th = 0·7 : 9th = 0·9 (N. H.).)

Oct. 13th: Papillary œdema apparently decreased. Hæmorrhages near papilla the same, in the macula visible only with difficulty, and in the periphery decidedly less clearly pronounced than earlier. Vision 0·8–0·9 (without glasses).

20th: Papillary œdema very slight. Papilla margins visible everywhere except upwards. Veins less dilated, arteries more visible. In the macula traces of small hæmorrhages, but few seen in the periphery. Field of vision normal. Vision 0·8–0·9; with glasses (−0·25) = 0·9.

27th: Papilla considerably clearer and better delimited. Veins still somewhat dilated. The large parapapillary hæmorrhages thinner, the macula being free and only a few solitary ones visible in the periphery. Vision 0·9 (with −0·50 glasses).

Nov. 3rd: Pupil normal. Papilla shows very slight changes. Resorption progressing rapidly; in the periphery it is possible only when making a very minute examination to see a few very slight remains of hæmorrhages. Close to the papilla, they are considerably thinner than before. Tension of both eyes 17 mm. Hg (Schiötz). Vision 0·9 (−0·50). Subjectively there is only a slight dimness of the right eye.

10th: Subjectively without symptoms. Delimitation of papilla only slightly indistinct. Veins somewhat dilated. Parapapillary hæmorrhages still visible, though reduced in size, paler, and thinner. Otherwise no hæmorrhages anywhere in the fundus. Vision 0·9 (−0·50).

Jan. 5th, 1937: Vision 1·0 (−0·50).

DISCUSSION

It is hardly necessary to discuss the diagnosis, thrombus in the main trunk of the central vein of the patient. The sudden decrease in vision indicates a circulatory disturbance and the ophthalmoscopic finding is characteristic. Stasis phenomena—i.e., papillary œdema, dilated veins, constricted arteries, and hæmorrhages—occur also in cases of choked disc and papillitis, but the symptoms do not appear suddenly in those, and furthermore the hæmorrhages are confined to the posterior part of the fundus. Hæmorrhages in the periphery, occurring at the very beginning of the disease, may be considered characteristic of venous thrombus. The obstruction to the blood flow cannot have been complete, as the symptoms would then have been more serious.

One of us (K. G. P.) had a rather discouraging experience of circulatory obstructions in the main trunk of the central vein, which led us to form an unfavourable prognosis. The fact is that symptoms, inconsiderable in the beginning, are very often found to be aggravated in the course of a few days, the papillary swelling, venous stasis, and hæmorrhages increase, and the vision decreases simultaneously. Probably clots accumulate on the thrombus, thus still more impeding the blood flow, so that the obstruction becomes more complete. The danger of an increased tension is then very great, and the eye frequently becomes blind; if pain ensues, enucleation may be found necessary.

Of the 78 cases of thrombosis of the vena centralis on our records, the majority are branch thrombi, of no interest in this connexion. One of us (K. G. P.) has had the opportunity of studying a total of 13 cases of thrombus in the main trunk; 9 of them became blind, 8 on account of increased tension, 1 due to proliferating retinitis and retinal detachment; 5 of these blind eyes were enucleated, possibly more, as it was not possible to follow the other three cases. Out of the remaining 4 cases, without increased tension, the vision of one is 0·3, of two 0·1, and of the fourth temporal hand movements—i.e., practically blindness.

It may be argued that our prognosis was too unfavourable and that the disease might have pursued a comparatively innocent course even without any treatment whatever. Experience proves, however, that even an incomplete obstruction of the main trunk of the vena centralis will practically always result in a permanent, more or less pronounced, decrease in vision. Recovery will, even in the most favourable cases, require a long time, six months or more. It must be unique to witness the disappearance of hæmorrhages and the increase of vision to its normal value in so short a time as 5–6 weeks.

Our treatment was based on the following reasoning. In the main trunk of the right vena centralis or possibly in its continuation a thrombus is formed, possibly increasing through the accumulation of fibrin or thrombocytes, until the obstruction at last becomes so considerable that venous stasis, ischæmia, and hæmorrhages appear, followed by a decrease in vision. By continual effect of heparin—known to be an anticoagulating principle of the blood—the growth of the thrombus will be counteracted. Any fibrin present may be expected to retract, and consequently the obstruction to the circulation will be reduced or the dilated veins will more easily admit a flow of blood past the thrombus.

Considering the comparatively rapid disappearance of the heparin from the blood, only a small part being traceable in the urine, as well as the fact—according to Jorpes and others (1937)—that its rapid destruction in the tissues is not very likely, we may perhaps presume a diffusion through the capillary walls out into the tissues, the latter then being heparinised. It does not appear unreasonable to suppose that the blood of the hæmorrhages then remains more liquid and may be resorbed more easily. In the present case most of the hæmorrhages remained the same colour, until they were resorbed with most unusual rapidity.

One can hardly be mistaken in ascribing the unusually favourable course of this case to the heparin treatment. Consequently it is interesting to look forward to the effects that may be produced in all the greatly varying processes where it may be of importance to be able to prevent the precipitation of fibrin in blood, in the other body fluids and tissues, or on serous membranes, &c. It seems to be established above that venous thrombosis of various kinds first and foremost comes under this category.

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THROMBOSIS OF THE POSTERIOR-INFERIOR CEREBELLAR ARTERY (WALLENBERG SYNDROME) TREATED WITH HEPARIN

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Heparin, the body's own anti-coagulant, now being available in a pure form, its use in medicine is of current interest. It was discovered by Howell (1916) and thanks to his works it was made generally known. Charles and Scott of Toronto (1933) worked out a preparation method of practical value, and Jorpes of Stockholm (1935) discovered its chemical nature, so that the substance has now been obtained in a pure form.

It is evident from the work of Crafoord (1937) and Murray and Best (1938) that fairly large doses of the pure heparin may be repeated intravenously without causing any definite inconvenience, and that it is possible in this manner to endeavour to prevent the formation of thrombosis or to check the growth of fresh thrombi already formed. The case reported above by Holmin and Ploman is an experiment in that direction, and owing to the position of the thrombus the course could be followed in a satisfactory manner. The case of Wallenberg's syndrome described below, in which a thrombosis of the posterior-inferior cerebellar artery produces the symptoms, was considered suitable for such treatment.

CASE REPORT

A married woman, 48 years of age. Healthy in childhood and adolescence except for some slight infections of the air-passages. Operated on in 1916 for appendicitis and salpingitis. Thenceforward healthy until early in 1935 when diabetes mellitus became established. Since then has received regular ambulatory treatment for her diabetes (dietetic treatment without insulin), which was of a mild character. Never suffered from any kind of arthritis.

In the night of Sept. 12th, 1937, patient woke, having been quite well the day before, with a throbbing head and a headache localised to the left side of the back of the head. She continued to do her daily work but was troubled by diplopia and a feeling that she was being pulled over towards the left. After about three weeks the symptoms ceased to trouble her. On Nov. 21st, 1937, she began to feel unwell, recovered temporarily and did her housework for two days, but on Nov. 24th woke at 4 A.M. with a bad headache and vertigo. The right half of her face was in a cold perspiration, the left half stiff and anæsthetic. In the morning the patient noticed a tendency to fall to the left. Temperature 98·8° F. She became worse, finding it difficult to swallow or to speak. The next day she vomited several times, with increased dizziness and vertigo, intense headache, inability to swallow or to speak clearly but with full understanding of what was said around her. She was admitted to hospital on Nov. 25th when, on examination, she looked "apoplectic," and her reactions were retarded and dull. Temperature and heart normal. SR 9 mm./hr. Blood pressure 180/90 mm. Hg. Urine tests: Almén +, Legal pos., Heller neg. Blood-sugar 180 mg. per 100 c.cm.

On neurological examination the *somatic motor component* showed a marked hemi-asynergia and hemi-ataxia of the left side. Every movement of the upper as well as the lower extremity on that side was carried out with very great uncertainty and displayed a distinct lack of coöperation of the synergic units of the left arm and leg. The patient tended to fall to the left, and her equilibrium was strongly affected. Her eyes were closed the whole time owing to diplopia caused by abducens paresis on the left side; when looking upwards she displayed a strong rotatory nystagmus. There was no atrophy of the tongue, and its movements were symmetrical. No fibrillar twitchings, no pareses or abnormal muscular or skin reflexes. Babinski and Rossolimo negative. Pupillary reactions and ocular fundi normal.

The *somatic sensory component* showed a loss of all sensibility on the left side of the face and head, up to the interauricular line and as far as the sagittal line in front, and affecting also the cavities of the nose and mouth on the left side. On the right side of the body, up to the interauricular line, there was a decrease in sensibility to pain and temperature, but not to touch. Smell, vision, and hearing were normal. Vomiting and vertigo continued, and since the slightest movement of the head intensified the latter the patient tried to lie motionless.

The *splanchnic motor component* showed a paralysis of the left half of the soft palate and of the left vocal cord. All food, solid or liquid, was regurgitated. Great difficulties were experienced in passing even a small duodenal tube for feeding purposes.

The *splanchnic sensory component* was normal.

Dr. Ragnar Bringel, called in on Nov. 26th, diagnosed the condition as a typical and fully developed case of Wallenberg's syndrome—i.e., a thrombosis of the left posterior-inferior cerebellar artery, with a lesion of the circumferential and intermediate zones of the medulla oblongata. The possibility of treatment by heparin was discussed and on Nov. 28th it was begun, since the symptoms had become more severe and feeding presented increasing difficulties.

TREATMENT

The patient was given intravenous injections of a 5 per cent. solution of standard heparin (Bergström, Jorpes, and Wilander 1937) obtained from Vitrum in Stockholm. The first injection, 150 mg., was made on Nov. 28th at 11 A.M. Some minutes after the injection the patient heard "murmurs," felt intense heat in the left part of the head, and some ill-defined general sensations, these symptoms lasting about half an hour. In the afternoon of the same day the patient was given another injection of heparin, 150 mg. No reaction followed this or subsequent injections of the same dose given t.d.s. for five days.

One incident is worthy of mention. On Nov. 29th, shortly after an injection, the mucous membrane of the throat was accidentally injured by the passage of the duodenal tube, causing bleeding. In the circumstances it was feared that the bleeding would be profuse; but actually the bleeding stopped after a few minutes and was never more copious than would have been expected in a normal patient. This observation led us to determine the capillary bleeding time in seven cases, using the ordinary method, 15–20 minutes before and after intravenous injections of heparin (150–250 mg.), and we have also carried out hæmoglobin estimations and red, white, differential, and platelet counts. No change could be demonstrated after the injections either in the bleeding time or in the blood. The fact that it was impossible to demonstrate any prolongation of capillary bleeding after the injections indicates, in my view, that the danger of any bleeding occurring soon after the injections is less than might be expected.

The course of the neurological symptoms was as follows:—

Nov. 29th (after 4 heparin injections): Mentally patient more lively. Able to put left heel to knee,

previously impossible. Aphonia less pronounced. Otherwise no change.

30th (after 7 heparin injections): Mentally condition about the same, but patient feels decidedly better after first calm night with good sleep since illness started. Ataxia of left arm decidedly decreased, and finger to nose test carried out fairly accurately. Aphonia definitely less pronounced.

Dec. 1st (after 10 injections): Mentally decidedly brighter, the headache and vertigo diminished. Patient can now move and turn in bed and lift her head without difficulty. The heel to knee and the finger to nose tests carried out perfectly. Aphonia practically absent. Paresis of the soft palate definitely decreased. Uvula still slightly drawn to the right. Cramp in the upper circular muscle of the œsophagus less pronounced. Patient can hold a glass of water in her left hand and drink from it without mishap. Cannot swallow solid food.

2nd: Progressive improvement. Patient eating bread and butter, though with some difficulty.

3rd: Patient bright, eats solid food without difficulty, sits up in bed without support, moves head easily. Nystagmus hardly noticeable, diplopia less pronounced.

6th: Patient sits up spontaneously, and can sit with her eyes closed without falling.

10th: Anæsthesia seems less; some sensitiveness to pain stimuli on the right side of thorax and upper arm, and a very little to heat and cold.

The patient's condition continued to improve steadily though slowly. Two months after being taken ill she could walk up and down the hospital passage, with support, and diplopia was no longer present. In another month she could just walk up and down the passage without support. Romberg's test (aggravated) negative. The paræsthesia remained but was less pronounced than formerly. Sensitivity to pain and heat and cold appeared to be normal only in the right half of the chest and abdomen and in the right upper arm.

DISCUSSION

It is hardly necessary to discuss the diagnosis in this case, all signs pointing to thrombosis of the left posterior-inferior cerebellar artery. The apoplectic beginning gave a decided indication of a lesion of a vascular origin. The clinical picture, especially the neurological changes, agreed in every detail with those of the Wallenberg syndrome. Since Wallenberg (1895, 1901) gave a detailed description of these symptoms, numerous cases of this kind have been reported. The essential clinical symptoms are: ipsilateral lateropulsion, hemi-asynergia, and hemi-ataxia; ipsilateral hemifacial anæsthesia, including all types of sensibility; contralateral loss of pain and temperature sensibility in the arm, trunk, leg, neck, and skin over the scalp up to the interauricular line; ipsilateral paralysis of the vocal cord and soft palate; the absence of all other motor and sensory symptoms. Sometimes the patient's illness at the onset shows remissions. Thus, for instance, a slight lateropulsion may come and go, the patient becoming definitely ill only at a later stage. The onset is usually apoplectic in character. The difficulties of swallowing if not very pronounced tend to decrease after some weeks. Generally the disturbance of equilibrium does not definitely keep the patient in bed, the ability to walk and stand straight usually returning, though seldom completely. Tilney and Riley (1928), giving an account of the Wallenberg syndrome, illustrate it by describing a case in which the patient made a complete recovery. They say of the duration of the initial stage in their case, evidently a slight one: "He remained in this critical condition for a number of weeks, during which time it was necessary to feed him by tube because of his marked dysphagia."

The case described in this paper must be considered a severe one. Considering the prognos quo ad durationem indicated by experience, it is striking how rapid was the improvement after the heparin treatment. The possibility that the effect was due to suggestion is excluded by the mental condition of the patient.

I am greatly indebted to Dr. Ragnar Bringel for assistance with the neurological part of this work.

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Clinical and Laboratory Notes

A NOTE ON THE DETERMINATION OF BLOOD ASCORBIC ACID

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In the determination of ascorbic acid in plasma as described by Farmer and Abt (1935, 1936) and later modified by Pijoan and Klemperer (1937) the deproteinised fluid is titrated in a 50 ml. beaker with 2 : 6 dichlorophenol-indophenol to a pink end-point, using illumination with a daylight filter.

Rapid titration to a pink colour varies so much with the individual observer that some more definite end-point seemed to be desirable. After a series of experiments to produce a suitable colour with which to compare the unknown titration, I found the standard colour described below to be the most suitable. When this colour match was used the rate of titration was increased and, in addition, a more accurate method of estimation was provided.

For the standard colour, the following two solutions are required: Solution A (0·5 millilitre) is added to solution B (0·5 millilitre) and the mixture is diluted to 35 millilitres with freshly boiled and cooled distilled water.

Solution A: This is a solution of methyl-red in alcohol and is prepared as follows: methyl-red, 0·002 g.; N/20 NaOH, 0·76 ml.; 90 per cent. alcohol, 4·0 ml. Dissolve in warm water bath and dilute with 20 per cent. alcohol to 200·0 ml.

Solution B: This is a buffer solution, the composition of which is M/5 potassium chloride, 50·0 ml.; N/5 hydrochloric acid, 2·62 ml.; distilled water freshly boiled and cooled to 200·0 ml.

It was found that the standard colour remained stable for at least one week when kept in a stoppered pyrex tube exposed to light at room temperature. But to eliminate any possible variation due to alkalinity of the glass container, it is recommended that the standard be prepared daily.

Comparison is made in pyrex tubes of 10 cm. length, 1·5 cm. external diameter, and 1·3 cm. internal diameter. The tubes are set at an angle of 55°.

The standard colour is delivered from a burette so that the volume of solution in the standard tube is equal to that in the unknown.

SUMMARY

The preparation of a standard colour is described, the use of which provides a more accurate and rapid method of estimating blood ascorbic acid by the method of Pijoan and Klemperer.

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EPIPHYSITIS OF THE CARPAL PHALANX

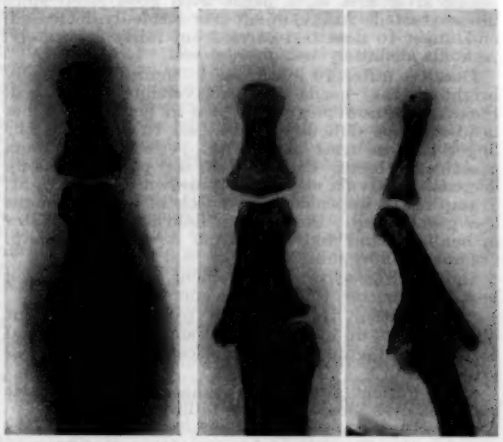
By A. H. Bizarro, F.R.C.S. Eng.

A student aged 18 consulted me for a stunted left ring-finger, five years after a fall on the closed fist. He was at that time suffering from colitis and diarrhœa. The ring-finger became at once swollen and stiff, but with little pain or tenderness. Artificial light treatment and calcium injections were prescribed at the time; no immobilisation was advised. His family history was normal.

When I saw him he was a strong-looking lad. His left ring-finger was short and bulbous. The skin as normal. As there was complete range of painless motion he was advised to do nothing to it. A recent radiogram shows destruction of the base of the middle phalanx of the ring-finger (see Figure); in a lateral view it looks like a cap over the head of the proximal phalanx. A similar appearance is seen in a radiogram taken 18 months after the onset of the condition.

The broadening of the base of the middle phalanx, the thickness of the primiphalanx shaft, the shortening of the metacarpal, the evolution of the disease all point to a clinical picture similar to that in the metatarsal head, which Freiburg (1914) called infraction, and Köhler (1923) as some epiphyseal disturbance—osteochrondritis.

In this particular case there was a definite injury,



A B

The affected joint (A) 18 months after onset; (B) 5 years after onset (anterior and lateral views).

yet at first sight it looked like a healed tuberculous spina ventosa. The main features of interest are:—

(1) Phalangeal osteolysis is a rare condition.

(2) Its similarity with tuberculous dactylitis.

(3) There was a full range of motion in spite of the deformity.

(4) The medico-legal aspects of such cases.

(5) The possibility of extending the term osteochondritis to a carpal phalanx.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF PHARMACOLOGY AND THERAPEUTICS

At a meeting of this section held on Tuesday, March 8th, with Dr. J. W. Trevan, the president, in the chair, Dr. W. W. Payne read a paper on

Vegetable Proteins in the Treatment of Diabetes

He said that his paper had been originally intended as a postscript to that of the late Dr. Otto Leyton on the same subject. He had compared his results with the more extensive findings that Dr. Leyton had obtained, and they agreed in all important respects, but Dr. Leyton's paper was unfortunately now not obtainable. The dietary protein used was Proferan, a gluten-like preparation made from a variety of bean. It was claimed by the manufacturers that this substance was metabolised by the diabetic without giving rise to extra carbohydrate, and therefore without causing a rise in blood-sugar or an increase in glycosuria. Dr. Payne had tested this claim, in observations on diabetic children, in three different ways. First he added 3 oz. of proferan biscuits or cakes (containing C. 5 g., P. 20 g., F. 20 g.) to the daily diet of five children who were stabilised on certain insulin dosages. During three or four weeks no significant change was observed in their glycosuria (tested by their parents at home) or in their blood-sugar values (determined weekly at the same time of day). Secondly, in "acute" experiments, he observed the blood-sugar curves over several hours after the ingestion of equivalent amounts of meat protein and of proferan; the former were distinctly higher than the latter. Thirdly, he took children on a basic diet in the hospital ward, and added to the diet for several days either 23 g. of proferan or an equivalent amount of meat and sardines; both caused some increase in glycosuria, but less in the case of the vegetable protein. He concluded, as Dr. Leyton had done, that some patients took proferan without showing increased glycosuria, while others did excrete more sugar, but less than after a corresponding amount of meat protein. He found an increased nitrogen excretion after proferan had been taken, but the difficulties of determining nitrogen balances accurately in children made it impossible to prove that the absorption of the substance was complete.

Dr. R. D. Lawrence said that he had failed to cause a rise in blood-sugar in normal subjects by

giving 75 g. of proferan. He agreed that the best test subjects would be adults with mild diabetes, but in general he found little use for special diabetic breads.

Dr. Lawrence then opened a discussion on

Zinc Protamine Insulin

He said that in the normal organism there was a small continuous secretion of insulin by the pancreas, on which was superimposed a rapid spurt every time a carbohydrate meal was taken. To reproduce both these processes in the diabetic by injection of extraneous insulins was a difficult task and had not yet been achieved, but the newer slow-acting insulins made possible a closer approach to it. He gave figures, based on experiment and clinical observation, for the duration of action of doses of the various insulins lying between 10 and 40 units as follows: soluble insulin, 4–12 hours; insulin retard, 8–16 hours; zinc protamine insulin, 6–24 hours or more. Hypoglycæmia was commonly observed sooner after a smaller dose, later after a larger one: with soluble insulin, at 2–4 hours; with insulin retard, at 4–12 hours; with zinc protamine insulin at 4–24 hours or later. Of zinc protamine insulin he gave usually one dose a day, in the morning, and adjusted it so as to render the patient's urine sugar-free, or very nearly sugar-free, early the next morning. In milder cases on suitable diets this dose would often keep the urine practically sugar-free throughout the 24 hours; general practitioners treating such cases would find their management easy and would seldom use anything but zinc protamine insulin. In severer cases, however, much sugar would be passed during the daytime, and in them Dr. Lawrence added a dose of ordinary soluble insulin in the morning, sufficient to bring about a normal blood-sugar level at lunch time; if glycosuria then developed in the evening and was considered undesirable a second injection of soluble insulin would have to be given in the late afternoon. But in these cases if full control of the glycosuria throughout the 24 hours was attempted, severe hypoglycæmic attacks were almost sure to develop. Dr. Lawrence had not used zinc protamine insulin in coma, and saw no occasion to do so. In some insulin-sensitive children he had observed hypoglycæmia developing surprisingly rapidly—e.g., in less than 6 hours—after doses of zinc protamine insulin as small as 12 units.

Dr. R. S. AITKEN reported some detailed observations designed to determine the duration of action of zinc protamine insulin. Patients were given 250–400 g. of carbohydrate in equal 3-hourly feeds day and night, and the time during which a given dose of the insulin exerted its effect was judged from (*a*) the return of the rate of sugar excretion to its pre-injection level, and (*b*) the reappearance of acetonuria. The two methods usually agreed fairly closely. In a given patient the duration of action was always roughly proportional to the dose, and with larger doses (60–100 units) clear evidence of persistence of action up to as long as 60 hours was obtained. The same dose would act for different periods in different patients. Dividing a dose into several fractions and injecting them simultaneously at different sites somewhat curtailed the duration of its action. Dr. Aitken thought it likely that a given dose of zinc protamine insulin developed its maximum action—i.e., the maximum rate of absorption of insulin from the injection depôt—within a few hours, and that thereafter its action gradually diminished; his findings strongly suggested this though they did not afford complete proof. If such a time-course were accepted, it followed that in treatment zinc protamine insulin should always be given in the morning and that the intake of carbohydrate over the 24 hours should be spread as widely as possible and made to decrease gradually from the morning of every day until the morning of the next.

Dr. E. P. POULTON regarded insulin retard as more nearly intermediate in its properties between soluble insulin and zinc protamine insulin, than Dr. Lawrence had indicated; he sometimes prescribed a mixture of all three insulins in one morning dose.

Dr. GEORGE GRAHAM considered that zinc protamine insulin might not begin to exert its action until 6 hours after injection; in this respect his experience did not bear out Dr. Aitken's findings. He used mixtures of soluble and zinc protamine insulins in some patients, of soluble and retard insulins in others, and he found the slow-acting insulins of great value.

Dr. PAYNE had found insulin retard less liable to cause severe hypoglycæmic reactions than zinc protamine insulin. He thought that the early absorption of quadruple strength zinc protamine insulin was faster than of double strength, and that a balance could sometimes be achieved with the former alone where the latter had failed. He had often observed that patients well balanced in hospital went out of adjustment a few weeks after returning home.

Dr. AITKEN, replying to Dr. Graham, said that he could not easily picture an injection of zinc protamine insulin lying inert at the site of injection for 6 hours and only then beginning to be absorbed. He gave high carbohydrate intakes in his experiments because he wanted to observe the amount of carbohydrate burnt or stored under the influence of insulin; he regarded that as a truer index of insulin action than the blood-sugar level, which was influenced by more factors than just the amount of available insulin.

Dr. LAWRENCE, in answer to a question, said that in giving soluble and zinc protamine insulins simultaneously, he drew both into the same syringe, the soluble first, and injected them together into the same site. There was evidence that in vitro this procedure caused some of the soluble insulin to become insoluble. He emphasised the irregularities in action of the slow insulins, which did not in routine treatment behave uniformly from day to day and week to week; for that reason he did not favour the blunderbuss method of injecting three varieties of insulin at once.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY

AT a meeting of this society held at the West London Hospital on March 4th, with Dr. D. G. RICE-OXLEY, the president, in the chair, an address was given by Dr. DONALD HUNTER on

Industrial Diseases

He referred first to the diseases of coal-miners, in particular miners' nystagmus and the condition known as "beat knee," which was caused by the cramped posture in which the men worked in the pit. In the ironmining and smelting industries great precautions had to be taken for the protection of the eyes of the workers, and until this was done the toll taken of sight was enormous. More than once it had happened that an occupational disease or liability to disease had been discovered, not by a medical man, but by those engaged in the industry. For example, it was the secretary of the glassblowers' trade-union who, at the end of last century, discovered the

condition known as glassblowers' cataract. As a result of the precautions now taken, this condition was disappearing. The cases of anthrax treated at the London Hospital over the period 1884 to 1935 had numbered 116, of which 98 were occupational. Only 1 of these was of the deadly pulmonary type, and among all the cases there were only 11 deaths. Dr. Hunter described the precautions taken to prevent anthrax among woolsorters by the careful cleansing of all wool at the port at which it was landed in this country. The same methods of protection were not applicable to furs and skins. Weil's disease was an infection of very wide occurrence to which London sewer workers were particularly liable. It was also found in workers in the sugar-cane fields of Queensland and on the canals of Holland. After discussing some of the new diseases associated with developments in chemical industry, such, for example, as the use of alkalis for chlorination processes, Dr. Hunter mentioned the heavy toll of life that lead poisoning had exacted. Even now, owing to the carelessness of workers in some departments, lead poisoning was not rare; the spraying of lead pigment by means of a gun was particularly dangerous. Alkalis headed the list of causes of occupational dermatitis. Chromium salts also caused a very severe dermatitis. Among occupations which involved the risk of cancer the industrial use of X rays should not be overlooked. Many industrial workers were now using powerful X ray apparatus, and it seemed possible that the same calamity might befall some of them as befell the early medical pioneers in this subject.

After discussing briefly diseases due to dust, Dr. Hunter summarised the various means available for preventing disease in industry. The first line of prevention was the elimination of dust and fumes; the next was the installation of protective apparatus uncontrolled by the workman, and the third, the education of the workman as to the nature of his dangers. Cleanliness of working places and the bodily cleanliness and general hygiene of the worker were obviously important. In Dr. Hunter's view England protected the workman in its factories against disease better than any other country in the world, not excepting Germany, where the regulations were more stringent but were less punctiliously followed. England had also the advantage of a factory department of the Home Office which was at all times ready to give advice and to take any necessary action.

MEDICAL SOCIETY OF LONDON

AT a meeting of this society held on March 14th, Mr. J. E. H. ROBERTS, the president, being in the chair, a discussion on

Uræmia

was opened by Dr. T. IZOD BENNETT. The word, he said, implied a physical disturbance resulting from severe renal failure. English physicians had not paid close attention to the condition until the beginning of the century, when the work of Widal and his collaborators in Paris had become widely known. The outstanding chemical change in every case was the increase in the blood-urea. The calcium was diminished, the phosphorus was increased, and there was often a considerable diminution in the alkaline reserve. These changes were closely related to the clinical syndrome. The clinical phenomena consisted mainly in gastro-intestinal disturbance, chiefly marked by a progressively severe vomiting and sometimes by diarrhœa; drowsiness, deepening to terminal coma; neuromuscular instability, sometimes amounting to tetany; fits; increase of pulmonary ventilation, or hissing respiration of the classical type.

The drowsiness and coma were closely linked to the increase in the blood nitrogen, and it was hard to escape the conclusion that they were directly caused by urea intoxication. Animals could be perfused with urea without coma resulting, but in man the accumulation of urea in the blood to which Bright had called attention was always associated with the depression of the central nervous system which was the major symptom in uræmia. A high blood-urea might occur without the clinical manifestations of uræmia. If, however, nitrogen retention was sufficiently low and insidious in its increase, it might rise to an extreme value before any great disturbance appeared. The same explanation applied in alkalosis. The phenomenon merely illustrated the important physiological axiom that symptoms due to changes in the blood chemistry manifested themselves in proportion to the abruptness rather than the mere degree of the change. The chronic alcoholic was seldom drunk, and the drug addict often exhibited very few obvious symptoms. A diabetic taking ordinary insulin might display hypoglycæmic symptoms which he would not show when his blood-sugar was even more greatly reduced by one of the slow insulins of the zinc type.

Bright's original work had contained nearly all the present knowledge about uræmia, and the question might be asked why the recognition of his discovery had been delayed for nearly a hundred years. The explanation was that it had taken a very long time for the important clinical manifestations of hypertension to become recognised. Hypertension, although it very often accompanied chronic renal destruction, was by no means invariable. It could occur with perfectly normal kidneys and might itself produce striking cerebral phenomena which could be confused with the symptoms of uræmia. The use of the sphygmomanometer and ophthalmoscope, together with some clinical acumen, were sufficient to distinguish hypertension from uræmia. In a vast number of cases, however, both syndromes were present together, and recognition of the nature of uræmia had been delayed by the difficulty of differentiating between them. Anything which could precipitate severe renal failure would tend to produce uræmia. The possible causes of renal failure were very numerous and, apart from purely medical causes, nervous shock and psychic factors could play a part. Surgery had been known to precipitate uræmia through the reflex effects of instrumentation in the lower urinary tract.

Dr. Bennett illustrated the problem of suppression of urine by two cases. In one the patient—as often happened—died of the cardiovascular complications. The other patient, in whom the cause was acute infective nephritis, had been quickly cured by drastic restriction of the diet.

Mr. A. DICKSON WRIGHT dealt with the surgical aspect of uræmia. He said that whether uræmia was caused by some insidious and undiagnosed kidney disease (medical uræmia), or was the result of long-standing urinary obstruction (retention uræmia), it might produce unusual signs and symptoms which closely mimicked some surgical emergency and might lure the surgeon into a disastrous operation. The chief error was to mistake the uræmic vomiting and abdominal distension for intestinal obstruction, for obstinate constipation was often a symptom. Radiological examination should be made as a matter of

routine when obstruction was suspected. The terminal colitis of renal disease might add rectal blood and mucus to the picture of vomiting and distension. The comatose dilatation might produce difficult problems, especially when the patient showed localising neurological signs, for there was then a great temptation to open the skull for cerebral tumour. Often, before entering the final coma, the patient had a heavy fall from uræmic vertigo or seizure and injured the head, and when coma supervened there might be a great urge to trephine. About the time that uræmia developed, the terminal infections of urinary disease often made their appearance, and it was then a waste of time to drain the peritoneum or pleura. The œdema fluid might become infected, and drainage should not be performed if the patient was on the verge of uræmia.

Medical uræmia came within the purview of the surgeon in renal rickets. Cystotomies undertaken for the cure of this condition often precipitated a fatal uræmia. Operations for renal decapsulation were occasionally asked for in cases of suppression. Denervation of the renal pedicle had been advocated, and injection of novocain in the region of the cœliac ganglion had been effective in overcoming suppression.

Surgical or retentive uræmia was apparently almost a different disease. The surgeon looked in vain for the muscular spasms, the epileptiform convulsions, the hemiplegias, and other symptoms of the medical type. It might be acute, and the commonest type occurred after operation on the urinary tract, especially upon the prostate. After a short period of drowsiness and delirium the patient passed into terminal coma. Death in uræmia might follow operations on or injuries to the biliary tract or liver. Long-standing jaundice due to obstruction of the common bile-duct might cause the patient's death about a fortnight after operation through the damage it did to the renal parenchyma. Chronic surgical uræmia might be manifested by a large variety of puzzling symptoms. Surgical uræmia was best treated by a constant intravenous drip, salt or glucose being provided according to the blood chloride estimation. Any simple procedure for overcoming obstruction should be carried out and stones should be removed. If both ureters had been ligated, the best procedure was bilateral nephrostomy. Operative decompression of the urinary system should be very slow.

Dr. WILFRID OAKLEY spoke of the relationship between renal function and the acid-base equilibrium. The alkali reserve was a useful guide to the state of this balance. In dealing with acidosis it was important to distinguish between cause and effect. Uræmia due to chronic renal disease was nearly always associated with acidosis due to the inability of the severely damaged kidney to form ammonia. A kidney might be structurally healthy but have its efficiency impaired by the increased formation, or administration, of acids. In severe diabetic coma a considerable rise in the blood-urea was not uncommon. Healthy kidneys might function well in spite of severe disturbance of the acid-base balance, but damaged kidneys might be greatly affected by comparatively small fluctuations. Intensive treatment of urinary infection by mandelic acid or ammonium chloride might produce a marked rise in blood-urea. Tests for renal function should be carried out in all suspicious cases of urinary infection before these drugs were given. Alkalosis might result from the administration of alkalis or from the loss of chlorine by vomiting. The loss of chlorine rather than the alkalosis then produced the renal failure.

Mr. H. B. WINSBURY-WHITE spoke of the advantages of pre-operative catheterisation to lower the blood-urea. Instrumentation, however, had its dangers, and he never carried it out in the consulting-room on an elderly prostatic patient. When it could be followed immediately by the fitting of an indwelling catheter uræmic symptoms rarely appeared, and renal function after the operation was likely to be better. The catheter itself might precipitate uræmia when the renal function was badly reduced, but these cases were much less frequent than those in which its use was valuable.

Dr. GEORGE GRAHAM said that alkalis were not of much use in medical uræmia but might be of considerable help to the surgeon. He asked why severe anæmia should often be associated with chronic uræmia and why iron had no effect. The diet of fruit juice, sugar, and water advocated by Dr. Bennett for acute nephritis would cause excretion of at least 7 g. of nitrogen and 42 g. of protein a day. He suggested administering about that quantity of protein to maintain the nitrogen equilibrium and avert protein destruction.

Sir WILLIAM WILLCOX stressed the importance of a blood-urea test in suspected uræmia. Cystic kidney might be associated with latent uræmia. The patient might have a very high blood-urea without any symptoms, and an accident or an attack of influenza might precipitate acute uræmia. The clinical symptoms were determined by the suddenness of the change. The toxæmic kidney would send up the blood-urea very high, but recovery was common. It might be due, among other causes, to respiratory infection or to the inhalation of a poisonous gas such as carbon tetrachloride. One patient had succeeded in obtaining heavy damages from a court of law for alleged food poisoning from a beef sandwich on symptoms due entirely to uræmia.

Mr. V. ZACHARY COPE confessed to grave doubt about the nature of uræmia. It was not necessarily associated with kidney disease; it was sometimes associated with grave hepatic disease. It was not simply due to high blood-urea. It was more likely to be due to two or three separate conditions, which would have to be distinguished before knowledge could be advanced.

Dr. T. JENNER HOSKIN advocated venesection, followed by transfusion, in certain cases, but pointed out the need for care when anæmia was present. One of the chief reasons for a two-stage prostatectomy was that it diminished the risk of uræmia.

Dr. G. W. GOODHART remarked that he had been taught as a student that uræmia was not caused by high blood-urea, and that a patient might die of uræmia with a low blood-urea.

Dr. BENNETT, in reply, mentioned the great importance of the specific gravity of the urine. Possibly, he suggested, the anæmia of chronic renal failure represented the toxic effect on the marrow.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY

A MEETING of this society was held on Feb. 24th, with Dr. ROBERT SCOTT, the president, in the chair.

Dr. FRANK ROPER described

A Type of Chronic Lung Disease

which, for want of a better term, he called emphysema of unknown origin and demonstrated an illustrative

case. A married woman, aged 42, had always had a cough, but without hæmoptysis and with very little sputum. For the past five years she had had attacks of vomiting and abdominal pain. Within the last 18 months her weight had decreased from 8 st. to 4 st. 13 lb. Her fingers were clubbed but repeated examination of her scanty purulent sputum had failed to detect tubercle bacilli. Radiological examination of the chest showed a large translucent area at each apex, the right larger than the left. Elsewhere, especially in the upper half of each lung, a large-celled honeycomb or cyst-like structure was present. Similar but less pronounced changes were observed radiologically in 1935. In Dr. Roper's view the diagnosis rested between (1) congenital cystic disease of the lungs with secondary infection, (2) bronchiectasis, and (3) tuberculous cavitation. He invited suggestions as to treatment.—Dr. R. L. MIDGLEY agreed that treatment in such cases was a more urgent matter than diagnosis. He advocated a general sanatorium régime. Antiseptic inhalations were worth a trial, and aspiration of the cavities through a bronchoscope might help. Despite the apparent scantiness of sputum it should not be assumed that the lungs were free from secretion and by far the most hopeful method of treatment was postural drainage. The simple rule of trial and error would determine which posture was best.

A Uterine Abnormality

At the same meeting Dr. MARSHALL SCOTT showed a decidual cast from the non-pregnant horn of a bicornuate uterus, a relatively common abnormality. The fœtus at the thirty-seventh week was found to be presenting by the breech and version was difficult. During labour the rotation of the fœtal head was delayed in mid-pelvis but, after manual rotation, forceps delivery was easy. The uterine abnormality was diagnosed immediately after delivery of the fœtus and placenta. The fœtus came from the right horn and the cast was expelled from the left on the fifth day of the puerperium. Microscopically the cast showed decidual changes and a good deal of small round-celled infiltration with a few polymorphonuclears. Decidual cells were not numerous and necrotic changes conspicuous. Dr. Marshall Scott pointed out that uterus bicornis was a frequent cause of sterility and abortion and that if the horns were unequal in size, one of them was frequently "blind."

REVIEWS AND NOTICES OF BOOKS

Genital Abnormalities, Hermaphroditism, and Related Adrenal Diseases

By HUGH HAMPTON YOUNG, M.A., M.D., Sc.D., F.R.C.S.I., D.S.M., Professor of Urology, Johns Hopkins University; Visiting Urologist, Brady Urological Institute, Johns Hopkins Hospital. London: Baillière, Tindall, and Cox. 1937. Pp. 649. 45s.

THIS encyclopædic text-book on genital abnormalities begins with an introductory account of hermaphrodites in literature and art. The reproductions of classical statues of "Hermaphroditos" suggest, perhaps, that the artist was seeking to represent an individual who combined the strength of man with the grace of woman, and not an unfortunate victim of hypospadias and gynæcomastia. In the remote past such malformed individuals were sometimes worshipped, sometimes killed; they may have suggested the conception of the divine Hermaphroditos who incidentally was always portrayed as beautiful if immodest.

Prof. Young describes the development of the genitalia in relation to the origin of the various types of abnormalities which he differentiates. There seems to be no abnormality conceivable by the most ingenious teratologist that has not been actually reported, with the one exception that no person has been found capable of acting both as a father and a mother. Ovary and testis may be present together in one individual, or male and female cells may lie side by side in the same organ; and there are many records of what Prof. Young calls "practising hermaphrodites," who have sexual intercourse with both males and females. His views on the influence of the endocrine glands in the development of the primary and secondary sexual organs are thus stated:

"The two great forces in determining the sex development of the individual are, first, the initial germinal impulse dependent on the chromosomal pattern of the zygote and, second, the endocrine glands. The former factor is presumably dependent on a quantitative balance between the male and the female elements of an always bisexual cell, and this balance is capable of partial or complete reversal by abnormalities in the endocrine system, with the production of sex intergrades of one sort or another. The chromosomal impulse is probably most important in the early phases of sex differentiation, the endocrine system in the later stages. The character and degree of intersexual phenomena depend largely on the phase of development at which the sex switch occurs."

The close connexion between the genitalia and the suprarenal gland is illustrated by the case, reported by Gordon Holmes, of a well-formed girl who developed very definite male characteristics. A benign tumour was found in the right suprarenal region, which Percy Sargent removed and the patient lost all her male attributes. Such successful operations have led surgeons to remove part of the suprarenal glands in such cases. Prof. Young describes an operation which he has devised for the simultaneous exposure of the two glands; he claims that in this way the surgeon can estimate the amount of suprarenal tissue present and the amount to be removed. This seems to be a severe operation not to be lightly undertaken; and indeed the caution applies to many operations here described which are undertaken mainly for psychological reasons. Except in cases where full and fertile sexual function can be restored, the surgeon must carefully study the facts and circumstances before operating. This applies especially to operations purporting to change the apparent sex of the patient; for example an individual might be better off as an imperfect male, even with some ovarian tissue inside him, than as a female with a vagina constructed out of peritoneum or from an artificial cavity in the pelvic cellular tissue.

The weakest part of the book is that dealing with the surgical treatment of hypospadias. Many plastic operations are described and elaborately illustrated by drawings, but it is disappointing to find no photographic illustrations of the end-results. (Incidentally the artist, who has made some beautiful drawings, has fallen into the common error of representing the sutures as drawn so tightly that they would inevitably cut out.) The work of the English surgeons who

use the hooded prepuce, transplanted to the urethral aspect of the penis, to form a new urethra is ignored, though this method has proved successful in all degrees of the deformity. In the large plate representing the varieties of atresia ani the one in which the reflection of the peritoneum from the rectum occurs well below the normal level is not represented. In these cases the bowel can be felt at the upper end of the anal canal and an incision produces a copious evacuation of meconium. The peritoneum is however wounded and the patient dies of septic peritonitis.

Le chirurgien devant l'état puerpéral

By MARCEL METZGER, Professeur agrégé à la Faculté de Médecine de Paris; Accoucheur de l'Hôpital Bichat. Paris: Masson et Cie. Pp. 335. Frs.52.

THE author of this unusual book sets out to help the general surgeon called to examine and treat a pregnant woman. The advice given follows English teaching in many ways, although in our view the surgeon is encouraged to perform hysterectomy rather too readily. After Cæsarean section sterilisation by hysterectomy rather than excision of the tubes is recommended, and in the presence of fibroids Cæsarean hysterectomy. The fact that fibroids do not necessarily interfere with a normal labour and puerperium is made clear but little guidance is given on the factors that influence the prognosis. Pre-arranged Cæsarean section is favoured before term, rather than operation during the course of labour. After reduction of inversion of the uterus the author advocates firm packing of the uterine cavity—a policy with which British obstetricians will not agree.

An interesting sidelight comes from the preface on the sequence of consultations in France where the pregnant woman is evidently liable to be subjected to examination first by a general surgeon, should some abdominal emergency arise, rather than by an obstetrician. The obstetrician's reputation for surgical judgment and technique is evidently not so well established as it is in this country.

Lectures on the Epidemiology and Control of Syphilis, Tuberculosis, and Whooping Cough

And Other Aspects of Infectious Disease. By THORVALD MADSEN, M.D., Director of the State Serum Institute of Denmark, Copenhagen; Chairman of the Health Committee of the League of Nations. London: Baillière, Tindall, and Cox. 1937. Pp. 216. 13*s.* 6*d.*

THESE lectures, delivered by Dr. Madsen at Vanderbilt University in 1937, formed the fifth series of the Abraham Flexner lectures. Three of them deal with the specific diseases named in the title with, naturally, particular reference to them as observed in Denmark. The other two are more general discussions, the one of the mechanisms of bacterial infection, the other of the influence of the seasons on infection. The inclusion of syphilis is appropriate, for Denmark, some century and a half ago, was the first country to adopt legislation for dealing with the spread of venereal diseases—legislation giving access to free treatment and at the same time making submission to treatment obligatory. Dr. Madsen gives a clear account of the present relatively favourable position of his country with regard to venereal disease and of the methods of control and treatment that he believes have led to it. Denmark is also fortunate in having a very low death-rate from tuberculosis. Much of Dr. Madsen's discussion of it turns upon the investigations being made there to discover and eliminate the present sources of infection, by tuberculin testing, by determining the frequency of bovine infections, by vaccination with B C G, and so forth. In agreement with other students of vital statistics he lays stress on the growing relative importance to-day of whooping-cough amongst the infectious diseases of childhood. We hardly regard as justified his statement that the higher death-rate of females over males from this cause, contrary to the general rule of mortality, is not due to a greater susceptibility of females to attack. Statistics of incidence are not easily to be found but certainly some of those available do not bear out his belief that the sex-incidence of infection is about equal. The favourable results of vaccination against whooping-cough he illustrates from experiments made in Denmark and in the Faroe Islands.

These lectures contain much that will interest both the epidemiologist and public health worker. The only adverse comment we have is that some of the diagrams—e.g., that on p. 180—are not worthy of the subject matter; the small scale reproduction makes them unreadable.

Practical Proctology

By LOUIS A. BUIE, A.B., M.D., F.A.C.S., Head of Section on Proctology, the Mayo Clinic; Professor of Proctology, the Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota. London: W. B. Saunders Company. 1937. Pp. 512. 30*s.*

THIS is a provocative and stimulating record of a clinician's wide personal experience of proctology. It is the differences rather than the resemblances between practice at the Mayo Clinic under Prof. Buie's direction and that generally adopted in this country to which we propose to draw attention. For example, the Hanes table—a piece of apparatus not often seen in England—is strongly recommended. Proctoscopy is carried out in the inverted position and operations are undertaken with the patient prone, a pillow being placed under the pelvis—two practices which might well be more generally adopted. Pruritus ani is discussed at some length. The only treatment advocated is the injection of 20 c.cm. to 40 c.cm. of 40 per cent. alcohol round the anus with the object of producing a slough of the whole of the peri-anal skin. This appears to be an effective if extremely drastic form of attack. It is to be noted, however, that the author states (p. 250) that "often there is extreme loss of the superficial tissues of the anus and its external margins, and because of this, at the clinic we never fail to impress on our patients the possibility of a secondary operation in order to correct the contracting deformity." And a little later he adds (p. 254) "in many cases, frequent dressings are necessary, and the surgeon may become discouraged as he observes the unpleasant result of his handiwork. There may be a bad odor and it may appear impossible to restore the outlet of the bowel to anything like its normal state, but perseverance will win out." Of 125 patients who submitted to this treatment, it is claimed that 116 were completely free of itching for two years or more.

Another controversial question raised is whether it is desirable to instruct the general public to wash

or to wipe the anus after a defæcation. The author holds that "even among the most refined people" the attempts usually made to clean the contaminated parts are quite inadequate, and goes so far as to suggest the daily use of a small warm enema of plain water or saline solution after evacuation of the bowel. It seems to us very doubtful if this method has much to commend it; a patient administering an enema to himself is more likely to soil his hands and clothes with fæcal material than to succeed in making any substantial difference to the number of bacteria left round the anal orifice. The comments on ulcerative colitis are optimistic in tone. A form of the disease caused by a streptococcus is termed thrombo-ulcerative colitis. The symptoms and signs are discussed and the assurance is given that vaccine and serum therapy are likely to produce a cure. Colostomy, ileostomy, and cæcostomy are, in our view, rightly condemned. Errors have crept into some anatomical descriptions. On p. 55 the middle sacral artery is made to run anterior to the left common iliac vein, and the right common iliac vein is placed superior and lateral to the right common iliac artery.

The last chapter is devoted to diet and to prescriptions, and the index is excellent. The style is concise and clear, and the book is very readable.

Therapie der Tuberkulose

Edited by Dr. J. VERBERICH and Dr. P. SPIRO. Leyden: A. W. Sijthoff's Uitgeversmaatschappij. N.V. 1937. Pp. 845. H.fl.25.

THIS solid work exemplifies the modern attitude to the treatment of tuberculosis—that it should aim not merely at the restoration of function of a particular organ containing a tuberculous focus, but at the cure of a generalised infective disease. Naturally such a conception has led to an extensive rather than an intensive development of the subject and the book contains fairly long chapters which are only indirectly related to therapy in the strict sense of the word. There are, for example, sections on the biology of the tubercle bacillus and the acid-fast saprophytes, sero-diagnosis and immunity which, though thoroughly up to date and informative, occupy space that might well have been devoted to more detailed consideration of actual methods of treatment. But a wide and generous interpretation of the term "therapy" has advantages and it is better to cast the net widely than to restrict unduly the scope of an important survey of our knowledge. The historical introduction by the veteran professor—Albert Fraenkel of Heidelberg—provides an interesting retrospect of the rise of the sanatoria, special hospitals, and other social movements of the nineteenth century in the fight against tuberculosis. Of the other chapters—all written by men with international reputations—those on the special sense organs, the psychoses, old age, diabetes, and pregnancy in association with tuberculosis stand out, perhaps because they are often inadequately reviewed. The long chapters on modern thoracic surgery and on bone and joint tuberculosis escape the tedium associated with descriptions of the minutiæ of operative technique, but enough detail is offered to give the general reader an intelligent understanding of the problems involved. It is a relief to find the text only sparsely interrupted by diagrams or radiograms which usually take up far too much space in modern text-books on tuberculosis. A short chapter on the comprehensive subject Fürsorge in tuberculosis (we have no adequate English substitute for this word) includes brief vital statistics. If a second edition is called for more space should be devoted to symptomatic treatment, especially in the care of the advanced case. The chapter on work-therapy is comprehensive, covering the activities of most of the well-known colonies, settlements, and workshops in Europe and America.

Treatment of Clinical and Laboratory Data

An Introduction to Statistical Ideas and Methods for Medical and Dental Workers. By DONALD MAINLAND, M.B., Ch.B., D.Sc. Edin., Professor of Anatomy, Dalhousie University, Halifax, Nova Scotia. Edinburgh and London: Oliver and Boyd. 1938. Pp. 340. 15*s*.

Prof. Mainland has been led in his own work and in the discussion and observation of the work of others to the consideration of modern statistical methods as applied to clinical and laboratory data. In interpreting these, and indeed any other, statistical data obeisance has to be made to the goddess of chance—in short, we have to determine as accurately as possible when a result observed is quite likely to be due merely to chance, and when chance is an unlikely explanation of it. Prof. Mainland's book is primarily an attempt to discuss that problem in simple terms, to show the clinician and other workers in medicine why and also how allowance should be made for chance in interpreting results, especially with small samples of observations. Wisely Prof. Mainland is not content with expounding merely a technique but aims at showing, as he expresses it, the reasonableness of the methods and formulæ he illustrates, rather than their exact mathematical reason. It is doubtful how far he has succeeded in this latter aim; whether in fact his discussion will be quite as simple to the average medical man as Prof. Mainland's own clear grasp of principles makes it appear to himself. To take an example, his introduction of the binomial expansion and normal curve for estimating the probability of certain proportions occurring in samples seems to us too rapid. Both here and elsewhere in his book more halting steps would have been appropriate for the audience he has in mind. He gives a detailed and well-illustrated discussion of the chi-squared test, and his remarks on those much-abused terms "significant" and "non-significant" are apposite. Other chapters deal with the variability of measurements, the simple analysis of variance, errors in measurement, correlation and curve fitting, and the publication of data and results. In the discussion on graphs is included (pp. 277–8) a quotation from Raymond Pearl which is difficult to follow out of its context.

In general we regard this book as valuable to the medical man already familiar with the foundations on which mathematical statistical methods are based rather than to the complete beginner.

CONGRESS OF COMPARATIVE PATHOLOGY.—The fourth International Congress of Comparative Pathology will meet in Rome from May 15th to 20th, 1939, under the presidency of Prof. Pietro Rondoni. The work of the congress will be divided into three sections: human medicine, veterinary medicine, and phytopathology. The main subjects for discussion will be ultravirus diseases, heredity in pathology, function of the associated antigenes, and regressive processes in plants. Further information may be had from the hon. secretary of the British Committee, 10, Red Lion-square, London, W.C.1.

THE LANCET

LONDON: SATURDAY, MARCH 19, 1938

NEW PLANS FOR CHEMOTHERAPY

FOREMOST amongst the matters discussed in this year's annual report of the Medical Research Council noticed on p. 683 is the big subject of chemotherapy. There will be widespread satisfaction at the news therein of the Council's plans for establishing chemotherapeutic research on a national basis. Medical men have no need to be reminded of the paramount importance of chemotherapy, particularly in the control of tropical diseases.

Many factors have contributed in the past to the lack of brilliant achievement in this field in Britain. Particular difficulties attach to research in chemotherapy. It is necessary on the one hand that chemists should laboriously synthesise new compounds to be tested. They may prepare substances analogous to others of known activity or, taking a shot in the dark, may produce compounds of quite new types, whose potential therapeutic value cannot be guessed and may well be nil. (It must have been a biochemist of whom it was recently broadcast: "He used to be a doctor, but he gave it up when he found a wonderful cure for which there was no disease.") While we are beginning to learn a little of the relationship between chemical structure and biological activity, there is still much more chaos than there is order and most of the research is still on hit-or-miss lines. Unfortunately the work of making substances to be tested rarely has enough purely chemical interest to attract young chemists to it. There have also been difficulties on the biological side. What the chemist has synthesised the biologist must test. Until recently chemotherapeutic achievement has been almost entirely in the field of spirochætal and protozoal infections, of which those amenable to laboratory investigations have been in the main trypanosome infections of rats, mice, and rabbits and malaria in canaries. It is unfortunately not always true that an agent which is therapeutically active against an infection in a small laboratory animal is equally effective against a closely related, or even the same species of parasite, in man or other larger animals. Since, however, it is impracticable to test all possible compounds directly on infections of man or of cattle, the small laboratory animal has to serve, in default of anything better, for a preliminary sorting-out of the offerings from the chemical laboratory. And it is true here also that this sorting-out process may degenerate into a dull routine. It is not to be expected that more than a very small proportion of the work will be directly rewarded by obvious success. The subject is thus not one that appeals to many young research workers and few take it up as a life-study. Most of the outstanding successes of chemotherapeutic research—the salvarsan group of drugs, Bayer 205, Atebrin, Plasmoquine—have come from Germany, where great industrial firms have for many years organised long-term programmes, and where large staffs of chemists and biologists have worked in close collaboration.

Realising that our backwardness in this field reflects no credit on a country with vast interests and responsibilities in the tropics, the Medical Research Council and the Department of Scientific and Industrial Research organised in 1927 a coöperative scheme under the direction of a chemotherapy committee. This body had at its disposal an annual grant of modest dimensions, with which it supported chemical research at a number of centres in the country, and also biological centres for testing the products of their activities and for investigation into underlying fundamental problems. While some substances of promise have come to light from this work—notably Neocryl, which seems likely to have value in the treatment of syphilis and trypanosomiasis—it cannot be claimed that the successes have been numerous or dramatic. A number of approaches were made to industrialists in this country, in the hopes of interesting them in the possible organisation by British industry of planned research such as had been so fruitful in Germany. No response, however, was forthcoming. Unfortunately the government's financial support of the scheme had, for reasons of economy, to be seriously cut down in 1931. Eighteen months ago, when circumstances were more propitious, the Medical Research Council was able to put before the government a very strong case for support on a much larger scale than anything yet undertaken. They could point out the enormous losses caused by tropical diseases of the type which chemotherapy might be expected to control, the moral and material disadvantages of our dependence upon foreign enterprise, and the failure of existing facilities in this country to make adequate progress in this particularly difficult field. A new factor was the astonishing success of Prontosil, sulphanilamide and related compounds, in bacterial infections, a sphere in which chemotherapy had shown but little promise of success. Medical men became familiar with the recital of new triumphs almost every week. Advance here was so rapid partly because of the readier accessibility of bacterial infections to laboratory study and there seemed every reason to hope that exploitation of this region of chemotherapeutic research would lead to fresh successes, if adequate facilities could be provided.

H.M. Government could hardly fail to be impressed by these arguments, and Mr. NEVILLE CHAMBERLAIN announced rather more than a year ago that a grant of £30,000 per annum would be allocated to the Medical Research Council for research in chemotherapy. The first year's income, or rather more, will be used for the erection of buildings. The Council's scheme involves the creation of a central chemotherapy institute, with a director, assistant director, and a full-time staff of trained biologists and chemists. The function

of their staff, as projected, would include, not only direct participation in certain lines of chemotherapeutic research, but the planning and coördination of the work in this field supported from the Council's fund in chemical and medical laboratories elsewhere. This institute will, we understand, probably form one wing of the building of the National Institute for Medical Research when this is rebuilt in the near future at Mill Hill. In addition, support will be given as hitherto, but on a larger scale, to chemical and biological work in chemotherapy in laboratories all over the country. Here is a scheme which offers promise of great achievement. Biologist and chemist will be working together in one building, able to discuss together their day-to-day problems and to acquire an insight into their common problem which has been almost impossible in the past. The scheme will, of course, have to face difficulties. It will not, for instance, be easy to find adequately trained biologists and chemists for the new centre. We are confident, however, that difficulties will be overcome, and that an important new chapter in British medical research has been opened.

SOCIAL REHABILITATION OF PROSTITUTES

THE rehabilitation of prostitutes has been a subject of heated debate for many centuries. The methods adopted to this end have varied from the orders given by the court of governors of St. Thomas's Hospital in 1599—that the patients should be beaten after discharge to discourage them from sinning again and "that by the terror thereof others may be admonished from falling to the like vice"[1]—to the occupational training given during treatment in the prophylactoria of the U.S.S.R., where efforts are made to place patients in suitable posts after recovery. Free treatment for venereal diseases is now organised by the State in most countries, but the so-called social services—follow-up, financial help during treatment, moral guidance, and vocational training—are still lacking in many of them. The League of Nations therefore issued a world-wide questionnaire on the subject in 1935, and the answers have now been summarised.[2] Twenty-two of the forty-eight countries replied that there were no social services available for prostitutes. In most of the others attention, it is said, is paid more to their medical than to their social or moral rehabilitation, and in some attempts to promote the latter have been given up as useless. Even in the United States there is "little or no direct effort to improve the patients' morals or to provide vocational training." In Russia the Commissar in Public Health works on the assumption that "in a worker's state there is no place for prostitutes." The government therefore sets itself the task of suppressing prostitution and has taken up rehabilitation as a means to that end. There is no attempt to reform prostitutes unless they have venereal disease; they are then treated in prophylactoria, first to cure them secondly to educate them to work, and thirdly to enable them to earn their living afterwards. The length of treatment is eighteen months on the average; a shorter period has been found useless. It is claimed that the system has been a success. Of 3800 women treated in Moscow, 56 per cent. found employment afterwards, and 90 per cent. of those who found employment remained in their jobs. The Russian experiment, of course, has a limited application outside the U.S.S.R. because the practice of prostitution in Russia does not produce material gain—luxurious rooms, clothing, or food—and there is no difficulty in finding employment for women after completing treatment. Estonia tried to follow the example of Russia, but the experiment proved a failure.

In France there is a special division of the "service social à l'hôpital" which deals with rehabilitation. It has been established now for twenty years and is State-aided. Its function is to overcome the moral, social, and economic obstacles that retard or prevent the prostitute from resuming her place as a useful member of society. The social assistants are generally trained nurses who have taken up social work as a special branch, and do not therefore correspond with the almoner as understood in this country. Our almoner service was primarily started to prevent hospitals from being exploited; and follow-up, care of patients after discharge, and philanthropic work were added to this function later. The French system was started primarily for the patients, and has nothing to do with hospital finance. The duties of the social assistants are to instruct the patient in the nature of her illness, ensure regular and continuous treatment, trace the source of infection and any infected contacts, and to give help and advice.

In England social service for the rehabilitation of prostitutes has been in existence for over 150 years, though apparently those conducting the League of Nations inquiry are unaware of this fact. It was started in London by the Rev. THOMAS SCOTT, the commentator, when he founded the rescue home attached to the London Lock Hospital in 1787. SCOTT was chaplain to the hospital, and he found it was impossible to do anything for the moral benefit of the patients unless he could provide them with shelter, food, and clothing for a considerable period after they were fit for discharge from hospital. The rescue home was therefore started alongside the hospital, and suitable patients were transferred there as soon as they had reached a non-contagious stage. They were taught dress-making, laundry work, and domestic duties. When cured they were found suitable posts, supplied with an outfit, and given a bonus for each year they remained in the post found for them. That is probably still the best system if it is carried out with wisdom and humanity, but it is obviously very expensive. Accordingly the London County Council, when they took over the poor-law infirmaries in 1930, tried the "hostel" system; there are seven of these hostels in London. In them women are

[1] Parsons, F. G., History of St. Thomas's Hospital, Vol. I, p. 240, London, 1932.
[2] Social Sources of Venereal Disease. League of Nations Publications. London: Allen and Unwin. 1938. Pp. 66. 1s. 3d.

given free or cheap board and lodgings, and carry out their treatment at the hospitals to which the hostels are attached. Not many adult prostitutes find their way into them. A certain number of young women who have just lapsed into prostitution are admitted; but the greater number are wage-earners who for the time being are unable to earn their living. By taking them in hand, looking after their creature comforts, and giving them the shelter of a home temporarily such women are often saved from prostitution. One advantage of the system is that girls are not cut off from the outside world, as they would be in a home, and so have not to be reacclimatised to the world again. The disadvantages are that a hostel is not a suitable place for women in the acute stages of venereal disease, for pregnant women, or for girls on probation. These require institutional treatment. In France this is given in hospital until patients are fit for ambulatory treatment; but in England the Lock Hospital authorities have found from long experience that such women do best if kept until cured. The London County Council have now followed this example, in spite of the extra cost entailed, because they too have found that women who are willing to remain as in-patients in the wards will not come back regularly for treatment once they have left.

It may thus be seen that most European countries are taking this problem in hand, and handling it after some method adaptable to each country's national character. The results of these experiments in social reclamation, if judged from the *percentage* of genuine rehabilitation, are disappointing. But if one thinks rather of the individual women that have been rescued from misery, and saved from spreading disease, it seems well worth while to persevere and extend this work in spite of many disheartening failures.

THE THERAPEUTIC POSSIBILITIES OF HEPARIN

THE anticoagulant substance known as heparin was discovered accidentally in 1916 by JAY MCLEAN while he was working in W. H. Howell's laboratory; it was subsequently investigated by HOWELL and HOLT (1918) but it is only within the last ten years that interest in the practical exploitation of its properties has been revived. This revival is due in part to C. H. BEST and his associates in Toronto and in part to a group of workers in Stockholm. Until quite recently preparations of heparin have not been pure enough to allow of its introduction into the body, though hæmatologists have found it a serviceable anticoagulant for drawn blood. The work of CHARLES and SCOTT (1933) and of E. JORPES (1935) has now, however, made the substance available in a form that can be introduced into the blood intravenously without the production of untoward symptoms. Studies of the chemistry of heparin have led JORPES to believe it to be a mucotin polysulphuric ester[1]; and with others[2] he has put forward reasons for suggesting that it is produced by the tissue mast cells throughout the body and that it may normally have the function of a physiological anticoagulant. The possible scope of heparin in medicine has been extended by this work and its developments. WILANDER[3] has shown that heparinised samples of venous blood may be used for routine hæmatological examinations as well as for measuring the sedimentation-rate and also for determinations of blood-sugar, calcium, uric acid, non-protein nitrogen, and phosphatase. This discovery should reduce considerably the trauma which the hapless patient now suffers at the hands of clinical pathologists. Heparin has also been tried as an intravital anticoagulant for blood transfusion and in the treatment, prophylactic or therapeutic, of intravascular thrombosis. We published last year a review by HEDENIUS of 150 transfusions for which the blood donor had been "heparinised," no other anticoagulant being applied. Although no ill effects were observed this method seems to have no advantage over the simpler technique of adding sodium citrate to the shed blood and is of interest rather as a tour de force than as a useful addition to the armamentarium of a transfusion service.

The hope that heparin in suitable dosage may act as a prophylactic against post-operative thrombosis has some experimental justification. BEST and his colleagues have shown that in heparinised dogs thrombotic occlusion of traumatised veins does not take place and, more recently, that in such animals blood may be "shunted" through a glass tube without the formation of white thrombi which occurs in such experiments in the normal animal.[4] The success and safety of these experiments has led them to administer intravenous heparin to patients following operation[5]; 1000 units of heparin (10 mg. of the purified substance) are added to each 100 ml. of saline solution and the fluid given by the intravenous drip method at such a rate as will keep the coagulation time at three times its normal value. It is stated that "the injection is continued for varying periods up to fourteen days after the operation." Already 222 cases have received this treatment but no analysis of the results is yet available. CRAFOORD (1937) has recorded a small series of cases which showed that the injection was without danger and was not productive of a hæmorrhagic tendency. It is impossible to draw any conclusions, as MURRAY and BEST are careful to point out, until figures for a much larger series have been published. Since, however, deaths from pulmonary embolism after operation occur only about once in every thousand cases the therapeutic endeavour is bound to seem disproportionate to the results and only if almost complete success is attainable would post-operative injection of heparin be likely to become a routine practice. Of more practical importance, for the

[1] Jorpes, E., *Uppsala LäkFören. Förh.* 1937, **43**, 83.
[2] — Holmgren, H., and Wilander, O., *Z. mikr.-anat. Forsch.* 1937, **42**, 242.
[3] Wilander, O., *Acta med. scand.* 1938, **94**, 258.
[4] Best, C. H., Dowan, C., and Maclean, D. L., *J. Physiol.* 1938, **92**, 20.
[5] Murray, D. W. G., and Best, C. H., *J. Amer. med. Ass.* 1938, **110**, 118.

moment, anyway, is the suggestion of heparinisation of patients following such operations as embolectomy. We publish elsewhere in this issue accounts of experiments in therapeusis which will have a far greater interest to clinicians, as they suggest the possibility that heparin might prove valuable in such serious and common conditions as coronary and cerebral thrombosis. HOLMIN and PLOMAN record an unusually favourable outcome of a case of thrombosis of the central retinal vein treated with heparin and in MAGNUSSON'S case of thrombosis of the posterior inferior cerebellar artery an equally satisfactory recovery was obtained. It is difficult to be convinced by MAGNUSSON'S report that heparin influenced the course of the illness. The negligible hæmorrhage from an accidental abrasion of the pharynx suggests that blood coagulation had scarcely been affected by the heparin. The observations on the bleeding time following injection of heparin have no practical significance; this substance is known to prolong coagulation by its action as an antithrombin and antiprothrombin but to have little effect on capillary hæmorrhage. Further, to argue that a normal bleeding time indicates that there is no undue liability to hæmorrhage is to virtually deny the existence of hæmophilia. MAGNUSSON has taken a gloomier view of the outlook in Wallenberg's syndrome than is usually held in this country and the course of his patient's illness does not appear to differ greatly from that observed where no specific therapy has been employed. It is to be hoped that evidence will be collected of the efficacy of heparin in the treatment of established thrombosis. Meanwhile its therapeutic possibilities cannot be assessed.

ANNOTATIONS

HOSPITAL TICKETS

SINCE Lord Sankey, in presenting the report of the voluntary hospitals committee to the British Hospitals Association conference last year, advocated a State grant through some procedure analogous to that of the University Grants Committee, there has been a movement of public opinion in its favour although no specific recommendation was included in the report. The Scottish Department of Health had already suggested that State assistance might be rendered in the form of a teaching facilities grant in recognition of the service rendered by hospitals in providing facilities for medical teaching. This accords with a practice well established in Scotland by which the medical student is required to provide himself with a ticket. The rule on the subject at the Edinburgh Royal Infirmary, for example, is as follows:

> Every student visiting the wards, operating and pathological theatres, attending any clinical class in the Royal Infirmary, or acting as a clerk or dresser, must be in possession of a hospital ticket for the period during which he or she visits, attends, or acts.

A payment of this kind has been made since the earliest days of the Infirmary, two centuries ago. It may well account for some of the thoroughness of medical education in Scotland, since not only has the ticket-holder to record his attendance regularly but his parent or guardian would naturally desire to secure that the money is a profitable expenditure. The fee for a "perpetual" ticket has recently been raised to £18 from the 12 guineas at which it has stood for nearly one hundred years. In the last statement of account the amount received from this source by the Edinburgh Royal Infirmary was £5432. In a full year under the new regulation it will rise to about £8000. This provides an obvious basis upon which a grant could be made by the State through the University Grants Committee without encroachment upon the freedom of the hospital authorities. But before this practice could be extended by the committee throughout Great Britain it would be necessary for English hospitals to establish a similar procedure. Its adoption by the hospitals with medical schools in London would mean an addition of some £100,000 a year to their incomes, outside London an addition of £70,000 a year, taking as a basis the figures in the latest return of the University Grants Committee. No legislation would be necessary to carry out this arrangement which, if the medical schools agreed, could come into operation with the acceptance of each new student. The establishment of a uniform practice in England and Scotland would afford a basis for an approach to the Chancellor of the Exchequer for a corresponding grant from the Treasury to be devoted to that portion of the work of a hospital which benefits the whole community.

THE "SAFE PERIOD"

THE belief, held by H. Knaus, K. Ogino, and other advocates of the "safe period" method of birth control, that the period of fertility in the menstrual cycle can be accurately predicted has a three-fold basis. It implies first, that ovulation is an event which occurs spontaneously at a fixed time in each cycle; secondly, that the ovum is fertilisable for only a brief period; and thirdly, that the sperm is also short-lived. According to Stein and Cohen,[1] who have recently reviewed the problem, there is no reason for doubting the truth of the second and third of these propositions. They hold, however, that there is need for caution in accepting the theory that ovulation is a fixed event in the cycle. Their initial criticism of this theory is that several other workers have failed to confirm the observations by Knaus on which his conclusion that ovulation is a mid-interval occurrence largely rests—that the uterus is non-contractile during the second half of the ovarian cycle. Stein and Cohen are perhaps rather severe in this criticism, for while many workers have been unable to confirm Knaus's observations, others have obtained results in good agreement with them. Furthermore one must bear in mind the possibility that those patients who show uterine contractions in response to posterior pituitary injections in the second half of the menstrual cycle may not have ovulated in that particular cycle—for the occurrence of uterine contractions signifies only that the uterus was not at the time under the influence of luteal stimulation. Stein and Cohen appear to under-estimate this chance, for according to Mazer and his co-workers,[2] 30 per cent. of women who

[1] Stein, I. F., and Cohen, M. R., *J. Amer. med. Ass.* 1938, **110**, 257.
[2] Mazer, C., Israel, S. L., and Kacher, L., *Surg. Gynec. Obstet.* 1937, p. 30.

present no abnormality other than functional sterility may menstruate from a uterus which has not been affected by the luteal hormone.

This is not, however, Stein and Cohen's only criticism. While they accept the evidence that fertility in man is highest in the middle of the cycle, they hold that conceptions may also occur in the premenstrual and immediate postmenstrual periods. They accept also the view that ovulation may result, at times other than the middle of the cycle, from the stimulus of coitus. On the other hand, they disparage, perhaps unduly, evidence obtained from studies of the relation between intermenstrual pain and ovulation and of the condition of the ovaries and endometrium during the menstrual cycle. Some of this evidence, for example that supplied by Wharton and Henriksen [3] and by Rock and Bartlett,[4] has been very carefully sifted, and in our opinion certainly suggests that ovulation occurs in the middle of the cycle. Stein and Cohen admit that ovulation is probably a mid-interval occurrence, though they regard this as still unproven; but even if it is, they hold with many others that reliance on the "safe period" cannot be regarded as a practical contraceptive measure. Its main drawback according to them is the great irregularity and variability of the cycle [5] which makes it impossible to predict accurately the times of succeeding ovulations. This difficulty is of course recognised by all advocates of the "safe period" method of contraception. There are many clinical records which seem to show that it can be overcome. Records of failures may mean no more than that the method can be used with success only by a certain type of patient—perhaps only by women whose cycles are relatively regular, and who can be relied upon to abide by rigid rules. Meanwhile there are more reliable contraceptive devices for that large majority of the public whose principles allow of their use.

NURSERY SCHOOLS IN THE SPECIAL AREAS

THE Save the Children Fund Nursery Schools Committee is now responsible for ten nursery schools in distressed areas with accommodation for 545 children. In its fourth report, covering the period from May, 1936, to October, 1937, the present position is surveyed. The Commissioner for Special Areas has made substantial grants towards the cost of erection of some of these schools. He is precluded from aiding any enterprise which receives assistance from another Government department, and so cannot help with running expenses, but grants for maintenance are now being given by the Board of Education to all the committee's schools except the last one opened. A holiday school for the children in the special areas of Durham and Tyneside has also been acquired, a suitable building having been secured on advantageous terms at Haydon Bridge in the valley of the South Tyne. The committee is working in precisely those districts where nursery school conditions are at the same time most urgently required and most difficult to secure. The good work done by nursery schools in safeguarding the children's health is emphasised by one of the superintendents, who perhaps deduces rather too much from the happy circumstance that all the children in the second and third years at the nursery school escaped attack from epidemic prevalent in the district, only children in their first year being affected. The demand for nursery schools is constant: every school except the one most recently opened could be filled a second time from its waiting-list, and many requests for places come from doctors and welfare centres. The chief difficulty in the way of extension is a financial one. Special areas are too poor to provide much local support; the Board of Education grant does not become available until a school has been running for a year, and during that time the committee has somehow to find the whole of the upkeep. The value of the work is out of all proportion to the expenditure, and it is greatly to be hoped that the committee will acquire the independent income which will enable it to carry out much-needed expansion.

PAIN IN CARDIAC INFARCTION

IT is established that acute myocardial infarction may occur without pain, but the proportion of cases in which it is absent and the nature of the symptoms which take its place are less certain. Absence of pain was found to be uncommon by J. A. Kennedy,[1] who took as his starting-point 200 autopsies in which cardiac infarction not less than 1 cm. in diameter was noted. Of the infarcts 109 were classified as old and 142 as recent, according to the pathological appearances and history; recent infarcts being diagnosed only when the history of the illness was not longer than 6 to 8 weeks. In 51 hearts there was both an old and a recent infarct. A certain number of patients had other conditions such as cerebral vascular lesions, severe diabetes, and cachexia, which obviously rendered them unsuitable as subjects for this study on the presence or absence of pain, and they were excluded. Among 86 cases of recent infarction there was definite pain in 91 per cent.; discomfort was noted in 4·3 per cent.; and neither pain nor discomfort in 4·3 per cent. In 102 cases of old infarct the percentages for these three categories were 63·7, 13·7, and 22·5 respectively. In this group were ten patients with histories of attacks of brief pain only—i.e., not more than a few minutes. The sensations classified as discomfort generally took the form of aching, tightness, or pressure in the chest, left arm, or abdomen. These results suggest a higher frequency of pain in infarcts followed by death—i.e., in the group of recent infarcts—than in the old ones. Kennedy believes, however, that the real differences may be less than the figures indicate, since in the second group the patient's recollection of his symptoms might be impaired by the lapse of time, and moreover the nature of the final illness may not have prompted a deliberate inquiry into this symptom. There seems no reason to doubt that a first infarction can be recovered from without producing symptoms which allow it to be diagnosed. On the other hand it has been observed that when infarction occurs in a heart which is already affected by an old one there may be no pain but congestive failure may develop, or previous failure be intensified.

THE YOUNG PRACTITIONER LEARNS HIS JOB

MEDICAL students often start their career by listening to an address designed to stimulate their interest in their future profession and their loyalty to the particular school which is preparing them to join it. Through the kindly offices of the British Medical Association they can now, if they choose, round off their curriculum by the same process. Last week an excellent discourse was provided for

[3] Wharton, L. R., and Henriksen, E., *J. Amer. med. Ass.* 1936, **107**, 1425.
[4] Rock, J., and Bartlett, M. K., *Ibid.* 1937, **108**, 2022.
[5] See *Lancet*, 1937, **2**, 1327.

[1] *Amer. Heart J.* 1937, **14**, 703.

their benefit by Sir Kaye Le Fleming, chairman of council of the Association.

Speaking as a general practitioner to many who would find themselves engaged in that, "the most highly specialised branch of medicine," Sir Kaye hinted at some of the dangers that beset their path, for which they were too little prepared. They must turn their attention, he said, from the narrow study of disease, its detection and cure, to the broader study of humanity and remember that while the doctor studied the disease the patient studied the doctor. At the beginning of their career they might not unfairly be regarded as mariners, who, having learnt in detail the construction of the different parts of a ship, are expected to put to sea without any lessons in navigation. For the sea of general practice is an uncharted sea, full of dangers, which are only learnt by those who sail upon it. And yet in the five years or more spent in fitting themselves for this kind of seamanship they received no help from those who are experienced navigators in this particular sea. The general practitioner had responsibilities to his fellows, to the State, and to the public as a whole, as well as to his own individual patients; and all these constituted his contribution to preventive medicine. He must nowadays be competent to give advice on social hygiene, milk, nutrition generally, industrial and occupational ill health, overcrowding, and the laws of physical and mental fitness. The newly qualified man has still much to learn, but it is encouraging to hear that in spite of criticisms of the curriculum Sir Kaye deems him to leave hospital better prepared for his work to-day than he was 40 years ago. A large audience of senior students and young practitioners listened to the discourse with obvious appreciation and enjoyed the film showing physical exercises that followed it.

THE MACHINE AND THE WORKER

A MAJOR problem of industrial civilisation is the adaptation of machines to the reasonable capacities and limitations of the human beings who have to work or feed them. The feeding of a machine may impose serious stresses upon the worker who has to keep pace with its requirements. He has to move in a uniform manner which conflicts with his natural habit, and when the machine compels him to go faster than his natural rhythm, his conflict is much greater. S. Wyatt and J. N. Langdon, with the assistance of F. G. L. Stock, have been investigating, as part of a general study of industrial methods, the problems of machine feeding, and their report[1] brings to light several facts which are often disregarded. They found that efficiency varied widely—between 52 and 86 per cent. of the maximum possible output—and that poor performance was due either to excessive involuntary stoppage or to failure to keep pace with the machine. There was some evidence that a machine will, so to speak, pull a tired operator after it, and that the desire to rest is largely satisfied by prolongation of machine stoppages. There may be an optimum feeding space and apparent rate of movement of the feeding mechanism for each worker. Perhaps the most important part of the investigation, however, concerned the likes and dislikes of the workers. Lists of items referring to possible sources of satisfaction and discontent were given to a number of workers to mark, and the percentages of the votes were worked out. The feature which most people liked best was "pleasant working companions." For repetition workers it is one of the most important sources of satisfaction, and without it many types of work would be almost intolerable. Half the witnesses valued the opportunity to talk, and in simple processes where conversation was particularly easy the proportion rose to three-quarters, but it fell to a fifth in the group working high-speed machines. Most of the workers seemed to be satisfied with the hours of work and payment, in the sense of having become adapted to those conditions. Interest was highest in comparatively varied work, and lowest when the chief characteristics of the process were uniformity and simplicity. Even slight changes in the type or conditions of work produced, however, important changes in the outlook of the workers. A feeling of competition appealed to more than one-third. The worst bugbears were "waiting for work" and "trouble with the machine," chiefly because they cut down the weekly wage. Next came monotony and noise, but the workers on the noisiest machines made the fewest complaints. The proportion of those who complained of fatigue varied much with the type of work: from 2 per cent. at a comfortable speed to 42 per cent. on fast machines. There was very little evidence that operatives like an "easy time"; these workers preferred work that lay between strain on the one hand and boredom on the other. Contentment is so closely related to rate of production that this study, though it is only introductory, ought to be of use to employers.

[1] The Machine and the Worker: a study of Machine-Feeding Processes. Medical Research Council: Industrial Research Board. Report No. 82. London: H.M. Stationery Office. Pp. 45. 9d.

THE FAMILIAL INCIDENCE OF MENTAL DEFECT

THE effective study of mental deficiency and its causation is no simple task. Although the books and papers on the subject extend to enormous proportions, even a superficial inspection of this mass of material shows not only how limited is our knowledge but what difficulties those encounter who seek to add to it. What, in fact, is mental defect? How is it to be recognised and defined? Is its degree susceptible of measurement? There can clearly be no satisfaction in confining attention to gross abnormality, the easier path taken by some of the early writers on the subject. If, as is becoming more generally accepted, intelligence is a graded character, like stature, with a continuous distribution in the community, there can be no hard and fast line drawn at all between the normal and the abnormal. A proper study of the problem must take into account the gradations of mental ability which will be found among both the patients themselves and their relatives. One hopeful line of approach is the study of the different clinical types identified among the mentally defective, partly by an application of general medical principles. Well-recognised diseases, however, are only found in a relatively small proportion of cases, though a number of little-known clinical abnormalities are associated with mental defect and this is not fortuitous. Even taking these into account there will always be a residual group of patients with no associated mental and physical disease, physically healthy but mentally inferior. The legal definition of defect is clearly not very helpful, being necessarily framed for administrative purposes and equivalent to a diagnosis of social incompetence. For scientific purposes intellectual inferiority is a more exact criterion.

Such considerations are sufficient to show that investigation of the causation of the different grades and types of defect must have a very wide scope. Statistics bearing on the problem can, and should,

be approached and analysed in many different ways. With the hope of increasing existing knowledge on this difficult but important subject a scheme of research was planned in 1930 under the joint auspices of the Medical Research Council, the Darwin Trust, and the Royal Eastern Counties' Institution. The first investigation, it was decided, should comprise the clinical and genetic examination of a large series of mentally defective patients. The direction of this work was placed in the able hands of Dr. L. S. Penrose, whose report has just been published. His laborious study of a representative group of 1280 patients of all grades and types of mental deficiency, of their parents, their offspring, and their 6629 sibs (brothers and sisters) leads him to conclusions which are summarised on another page. Among the many significant points that emerged from this inquiry is that the incidence of defect among parents and sibs of patients was estimated as between 7 and 9 per cent., whereas in the general population it is only 1 to 2 per cent. It may be that comparison of these figures somewhat exaggerates the difference, since defective children of defective parents are perhaps more likely to be placed in an institution than those of normal parents. But even if this possibility is taken into account the difference remains striking enough to lend support to the movement for voluntary sterilisation, especially in view of the much higher incidence of mental defect among the patients' own children.

MARIE CURIE [1]

BORN in Warsaw in 1867, the youngest child of a Polish professor of physics, Marya Sklodovska was brought up in an atmosphere of family devotion, national oppression, and economic exigence. At school she gave ample promise of extraordinary ability, but poverty put a stop to any prospect of a university career and she was obliged to become a governess. But she was no ordinary governess. In addition to her routine duties which she conscientiously discharged, she appointed herself honorary schoolmistress to the illiterate village children and devoted her evenings to the study of such text-books, often outmoded, as the local library afforded. Unexpectedly came the chance to read for a degree at the Sorbonne. This involved lodging in a wretched garret on a pittance of forty roubles a month. Despite the physical hardships implied she passed first in the master's examination in physics in 1893, and second in mathematics a year later. After an early romantic experience which came to grief, she put aside all thought of matrimony until she met Pierre Curie, already a distinguished physicist and some years her senior. They married and so began a partnership which was to prove emotionally and intellectually perfect. As a result of more than four years' research together in a shed which served for a laboratory, they discovered first polonium and then radium. The fame which followed brought no happiness to either and the untimely death of Pierre in a road-accident was a blow to the surviving partner from which for a time it seemed that she could not recover. She was offered a pension which she refused; she could still work, she said. She was given her husband's chair at the Sorbonne. The Institute of Radium, with Marie at the head of the laboratory of radio-activity, was founded and completed in July, 1914. Then came the war and the patriotism which as a girl she had felt for an oppressed Poland re-expressed itself in a desire to help her adopted country. She organised a radiological service for the wounded and herself operated one of the mobile X ray units, the "Curie-cars" as they were called. With the end of the war she came back to the laboratory where she directed the researches of others and continued her own. There she remained until her death in 1934 from aplastic anæmia—due to the effects of radium.

These are some of the salient facts about the life of a woman said (by Einstein) to be "of all celebrated beings the only one whom fame has not corrupted." Her stubborn singleness of purpose and her pure scientific detachment made her shrink from publicity and indifferent to honours. Material wealth made no appeal to her and she found poverty no more than mildly inconvenient. Her passion for research and her capacity for work amounted to an obsession which, however, was magnificently justified by results. A biography by her younger daughter, sympathetically written and admirably translated, leaves the reader with a picture of an indomitable ascetic of great intellect and of a most engaging simplicity.

[1] Madame Curie. By Eve Curie. Translated by Vincent Sheean. London: William Heinemann. 1938. Pp. 411. 18s.

BLOOD POTASSIUM IN INTESTINAL OBSTRUCTION

A YEAR ago [1] we drew attention to some recent work showing that a rise in blood potassium constantly accompanied experimental intestinal obstruction in cats. These observations have now been extended to man and the same group of workers [2] have published a careful study of 25 cases of human intestinal obstruction. The results are a little ambiguous. Among 20 untreated cases the plasma potassium was found to be raised in 7 and lowered in 5. In some other cases the plasma potassium was found to be raised even after considerable quantities of saline had been given so that it was probably higher still before treatment. Figures are supplied for the potassium content of many of the secretions and body fluids in patients with intestinal obstruction. These observations are of considerable interest, and constitute a real advance in knowledge; but it is clear that a rise in serum potassium need not necessarily accompany intestinal obstruction. A glance over the authors' tables shows that the serum potassium was not raised in a number of the fatal cases and *was* raised in some of those which recovered. Nevertheless the conclusion reached by the authors—that disturbances in blood potassium explain some of the symptoms found and the procedures used in intestinal obstruction—is probably justified.

THE RESTORATION OF HISTOLOGY TO ANATOMY DEPARTMENTS

WE note with interest that the teaching of histology in the University of Leeds is to be transferred from the department of physiology to that of anatomy. The university has good precedent for this administrative change, for a similar one has already been effected in several of the leading medical schools in the country. Some schools still hold out against a rearrangement that certainly seems logical, on the grounds that the teaching of histology has long been associated in this country with that of physiology, and that transference of its control to another depart-

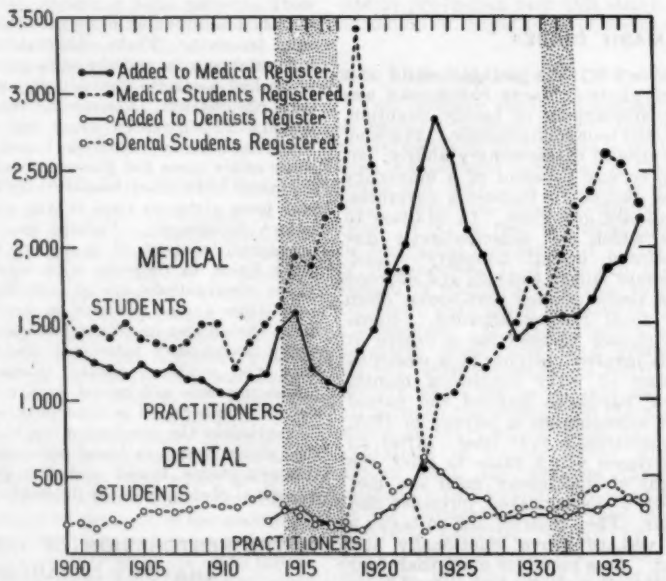
[1] *Lancet*, 1937, **1**, 639.

[2] Scudder, J., Zwener, R. L., and Whipple, A. O., *Ann. Surg.* 1938, **107**, 161.

ment might lead to undesirable changes in the type of histology taught. While all will agree that histology is of little importance if considered apart from questions of function, the same applies to the teaching of anatomy of any kind, gross or minute, to students of medicine. On the Continent and also in America the association of histology with anatomy has been the accepted rule. It cannot fairly be claimed that the subject of histology is in a more flourishing and vigorous state in England than it is in the United States or in continental countries. The inclusion of histological teaching, and of such histological research as teachers find time for, in the departments of physiology in England is to some extent accidental. It arose from the fact that physiology was first separated off from anatomy and made the subject of a separate chair at University College, London, at a time when the last of the professors of anatomy and physiology, William Sharpey, was known chiefly for his work as histologist and physiologist. It was not unnatural, therefore, that at the time of the partition histology should drift into the physiological laboratory. It was welcomed there then because the teaching of histology required relatively simple apparatus and equipment, and provided something definite in the way of a practical course of instruction, comparable with that already provided on the anatomical side by the dissection of the cadaver. With the subsequent large growth and development of experimental physiology, including experimentation on the human volunteer, together with the vast expansion of physiological chemistry, the difficulty in filling up the hours devoted to practical work in physiology was removed. Nowadays many physiologists find that the teaching of histology in their departments robs them of time which could be better used in the performance of experiments of some kind or another. It is perhaps not without significance that University College was also among the first medical schools in Great Britain to restore the teaching of histology to its anatomical department, a change effected as long ago as 1923.

THE 1938 REGISTERS *

THE official registers tell a simple story. The entry of medical students began to fall in 1935 and fell more sharply last year. The number of names added on qualification to the Medical Register still continues to rise from year to year and will so continue for a while, corresponding to the 1935 peak of student entry. Every section of the Medical Register shows an increase. In England 176 more names were added than in the previous year; in Scotland 103 more; in Ireland 16 more, and in the Colonial section 13 more. The total number added is 2214, to equal which we must go back as far as 1925, and the number of names on the Medical Register on the last day of the year exceeded 60,000 for the first time. The drop from 2544 to 2297 in the number of medical students registered during the year was due principally to a fall of 198 in the entries in the English schools—there were 57 fewer medical students in Scotland, but 8 more in Ireland; indeed a noticeable feature of the student entry is the constancy of the numbers in Ireland during recent years. The dental figures tell a different tale, as indeed might be expected when the adjustment has been left so much less than in the case of doctors to the simple law of supply and demand. The Dental Board of the United Kingdom has relaxed no effort to keep up the numbers in the Dentists Register, but in spite of this there was a sharp drop last year in the new entries from 355 to 299, the entry of dental students also falling but to a much lesser extent. In fact, practically speaking, the dental student entry was the same as in the previous year. The tendencies we have mentioned can be seen on the graph which has been brought up to date.



* The Medical Register for 1938 (21s.), The Medical and Dental Students Register for 1937 (7s. 6d.), The Dentists Register for 1938 (12s.). All published for the General Medical Council by Constable and Co., Ltd.

Major RODERIC DUNCAN CAMERON, M.C., R.A.M.C., has been transferred from the Directorate of Medical Services in India, where he has been since April, 1935, a deputy assistant director, to the War Office as deputy assistant director-general, Army Medical Services.

ON March 22nd and 24th at 5 P.M. Dr. J. A. GREENFIELD will deliver the Oliver-Sharpey lectures to the Royal College of Physicians of London. He will speak on recent observations on the morphology of the neuron, and the changes which it undergoes in disease.

SPECIAL ARTICLES

MEDICAL RESEARCH COUNCIL

ANNUAL REPORT FOR 1936-37*

FROM their inception it has been the policy of the Medical Research Council to combine two main methods of supporting medical research. They have maintained their own central laboratories, the National Institute for Medical Research, where a permanent whole-time staff could pursue uninterrupted investigations under the best possible conditions; and they have made grants in aid of research work throughout the country in institutions which are linked with university teaching or hospital practice. An intermediate type of arrangement has, however, gradually developed under which appointments are made to individual members of the Council's staff for work in certain hospitals and elsewhere. This plan is obviously essential for clinical researches demanding hospital facilities. The Council have not only established a number of special units for clinical work but they have supported a unit of pathological work at a maternity hospital for the study of puerperal infections, while elsewhere in this issue (p. 686) reference will be found to the investigations made by a member of their staff in an institution dealing with mental defect. Different reasons have influenced the allocation of workers to various places. For example, work on the bacteriology of tuberculosis could best be conducted in close association with agricultural research on this disease in animals. Sometimes the choice of a centre has been determined by previous activity there in a particular subject, or by the presence of some senior worker whose directing influence was deemed of special value. In this way appointments for work on nutrition have been made at the Lister Institute and at Cambridge, and a special department for the study of bacterial chemistry is maintained at the Middlesex Hospital. In view of this development a new section has been introduced into this annual report giving a separate account of the work of those members of the external staff whose range of activities is not described in other sections under special headings.

A Move to Mill Hill

The need for additional laboratories for pursuing new work on chemotherapy mentioned below, as well as for that on biological standards and nutrition, has led the Council to an important decision regarding the site and buildings of their central institute. Its present site at Mount Vernon, Hampstead, is deemed unsuitable for further development on the scale now in view, even without allowing for future expansion. Furthermore, the main building there, originally a hospital and a dwelling-house, is neither modern nor ideally suited to its present functions. Provision for eventual demolition and rebuilding would thus have to be included in any scheme of development there, and the question has arisen where such provision could most profitably be made. The Council have possessed since 1922 thirty-nine acres of farm land at Mill Hill, where it was originally intended to carry out work which could not conveniently be done at Hampstead. It has already been found necessary to make much greater development at Mill Hill than was expected and if the buildings now required are built there the work of the various departments of the National Institute will be divided between two main sites rivalling each other in importance. This is regarded as undesirable, and the Council have decided to abandon the Hampstead site and concentrate the whole of the National Institute at Mill Hill. This will have the advantage of providing close contact and opportunities of collaboration between different departments and the convenience of common services. Proximity to the new main laboratories of the Imperial Cancer Research Fund, which are on adjoining land, should also be a source of mutual benefit.

Research in Chemotherapy

Mention was made last year of the government's intention to provide the Council with an additional £30,000 a year for the development of research in chemotherapy. The new grant has now become effective, but before actual investigation can be started the income of at least the first twelve months will have to be spent on buildings and equipment.

Chemotherapy in the narrow sense of the word consists essentially in the administration of chemical compounds synthesised in the laboratory and found to have specific actions on the infective organisms causing particular diseases; but in a wider sense the term includes the discovery of chemical substances having specific actions on certain bodily functions. Such drugs as aspirin, Avertin, and Percaine, for example, would fall into this category. The principal successes with chemotherapy in its restricted sense have so far been in infections with spirochætes and protozoa rather than with bacteria, but recent work with Prontosil in its different forms and sulphanilamide has opened up new ground which is being rapidly and effectively developed. Although several fundamental discoveries in chemotherapy have been made in this country, it is remarkable that the discovery and production of chemical compounds of therapeutic value depended almost entirely on German science and industry, and still so depends. Were the matter only one of prestige, the situation would be serious enough. But since when foreign firms have spent large sums of money to perfect a remedy, they naturally expect to derive substantial profit from its manufacture, they try by patenting processes and by refusal to grant licences to prevent its being made in this country. As things are the British Empire might, in case of war, be deprived of essential drugs. There is, then, strong reason for developing a national scheme of investigation here which will be not unworthy of comparison with the work done abroad. The financial requirements of such a scheme are too large to be met from ordinary resources. Research in this field is largely empirical and involves the production and testing of an almost infinite number of different substances. In Germany investigations have been mainly made by manufacturing firms employing hundreds of chemists, but the larger chemical firms in Great Britain have not appeared willing to use their resources in this manner; thus if this country is to play its proper part in chemotherapy there must be a national scheme supported from public funds.

The Council have long supported research in chemotherapy both at the National Institute and in various university centres, and for this purpose have collaborated with the Department of Scientific and Industrial Research at their laboratory at Teddington. The practical results obtained have

* Report of the Medical Research Council for the year 1936–37. London: H.M. Stat. Office. 1938. Cmd. No. 5671. Pp. 195. 3s.

been by no means negligible. In the last few months, for instance, what promises to be an important new series of remedial agents for trypanosome infections has come to light through a research in which Mr. H. King, D.Sc., of the National Institute has coöperated with Prof. Warrington Yorke and Dr. E. M. Lourie of the Liverpool School of Tropical Medicine. Starting with the synthetic base Synthalin, which was introduced some years ago as a substitute for insulin, they have investigated the trypanocidal properties of a large series of related bases, and have found one member of the series with as powerful a trypanocidal action as synthalin but a lower toxicity for the mammalian host.

Notwithstanding these and other results obtained in Great Britain this sort of work has clearly called for further expansion. In the absence of effective coöperation by industry, it was held that an essential factor in a national scheme would be a central laboratory with a staff able to give their whole time and thought to chemotherapy and providing opportunity for the close daily association of biological investigators with those engaged in the synthetic production of new compounds. The scheme would follow the general line of action of a great commercial organisation, with the extremely important difference that a commercial scheme aims solely at remunerative success and may even suppress valuable scientific information incidentally obtained; whereas a publicly supported scheme would be certain to produce material of much more than immediate value for the theoretical basis of the whole problem.

Sulphanilamide and Allied Substances

The great value of prontosil was first made apparent by its use in the treatment of puerperal sepsis by workers at Queen Charlotte's Hospital, headed by Dr. Leonard Colebrook of the Council's staff. The work has been continued, both with red prontosil and with sulphanilamide, and the good results in the treatment of infections of childbirth are well maintained. Possibly the first general indication of the public benefit initiated here is the reduction of the death-rate from puerperal sepsis in London from an average of 1·57 per thousand births between 1930 and 1935, to a figure of 0·75 in 1936. Spectacular results have also been obtained in other streptococcal infections, particularly in erysipelas and streptococcal meningitis, and more recently there have been indications of their curative effects in infections by meningococci, typhoid and other coliform bacteria, by dysentery bacteria, and, less impressively, by pneumococci and staphylococci. The sulphanilamide compounds bid fair to replace mandelic acid in the treatment of *B. coli* infections of the genito-urinary tract, as they are equally effective and more simply administered. From the standpoint of public health perhaps the greatest importance attaches to the reports of the curative effect of these compounds in acute and chronic gonorrhœa of both sexes.

A powerful remedy of this kind must be used with care and discrimination. Chemotherapy exploits the margin between the lethal effect of a drug on the invading micro-organism and its toxic action on the patient. In some circumstances, with particular preparations of the drug, or in certain patients the margin may be narrower than usual, and reports of ill effects of the use of compounds of the sulphanilamide group have not been wanting.

Influenza

In December, 1936, there began the first widespread epidemic of influenza in this country since that of 1933 which gave the opportunity for the first demonstration of the virus by transfer to the ferret. During this 1936–37 epidemic the characteristic virus was found in throat washings from no less than 30 out of 40 cases of typical uncomplicated influenza. In the early stages of the epidemic some six hundred soldiers and a hundred civilians were vaccinated with the inactivated virus in groups, each group being matched by an equal number of controls. The results were inconclusive, but it can be said with certainty that the vaccination did not give protection in all cases, even when it had a good chance. This lack of success becomes more intelligible and less discouraging in the light of recent advances in knowledge of the viruses from different epidemics. In December, 1936, Magill and Francis of the Rockefeller Foundation demonstrated a clear immunological difference between two strains of the virus obtained from different human epidemics, and this observation was later confirmed by C. H. Andrewes and Wilson Smith at the National Institute. Strains from various sources are now being studied and appear to fall into several immunologically distinguishable groups. In particular the original strain obtained from the 1933 epidemic, which was used for the preparation of the vaccine for the recent trial, is found to fall into a different group from those that occurred in the 1936–37 epidemic. If vaccination is to be successful it will probably be necessary to choose an inoculum made from a virus of the same group as that responsible for the immediate outbreak. Andrewes and Wilson Smith have found that normal ferrets can be infected with the virus with great regularity by merely placing them in contact with others already infected, and that vaccination with the same strain of virus will effectively protect the ferrets from such contact infection.

Egg-membrane Cultures

One of the chief obstacles to the investigation of the filter-passing viruses has been the failure to grow them in ordinary culture media, and research has therefore depended on constantly repeated passage from animal to animal. In 1931 Goodpasture and Woodruff showed that the chorio-allantoic membrane of the developing chick, which had been used since 1911 by Rous and Murphy for the study of fowl tumours, could be infected by various viruses, and that these could be propagated there indefinitely. As a result developing eggs can now often be used to replace experimental animals. Fertile eggs are comparatively cheap and require little attention, and moreover they reduce to a minimum the risk of accidental cross-infection—the bugbear of the study of virus diseases in experimental animals. In recent work published by the Council F. M. Burnet has shown that on prolonged passage from egg to egg influenza virus, while remaining virulent for the egg-membrane, loses its virulence for the ferret and mouse, and yet preserves its immunising properties. If these characteristics can be perpetuated, which is by no means certain, the value of such a strain for the immunisation of man is obvious.

Surgery of the Heart

The recent work of Laurence O'Shaughnessy on the surgery of the heart illustrates well the development of a technique along systematic experimental lines. O'Shaughnessy set himself the problem of supplementing the cardiac blood-supply in cases where there were symptoms of vascular obstruction caused by diffuse disease of the vessel walls. First, he studied the natural processes of repair and

compensation which often occur in coronary occlusion in man; secondly, after ligaturing some of the blood-vessels to the heart muscle in animals, he grafted and sutured living tissues to such hearts and studied the new blood-supply which resulted; thirdly, patients with an inadequate blood-supply to the heart as the result of coronary occlusion were subjected to similar operation, and new blood-supplies were established by grafts of living tissues. In 1931 O'Shaughnessy used grafts of the omentum in the repair of wounds of the œsophagus, and from this it was but a step to applying the graft to the surface of the heart. In animals it could be demonstrated that the presence of such a graft was compatible with normal function of the heart and lungs, and that, despite the foreign environment in which the omentum now found itself, its property of forming new blood-vessels remained unimpaired. The first patient was subjected to the new grafting operation (cardio-omentopexy) in January, 1936, and since then twenty further patients have been operated on in the Lambeth Cardiovascular Clinic of the L.C.C. There have been five deaths but the survivors of the earlier operations were all improved, and some formerly bed-ridden are now leading a normal life.

Salt Deficiency

Although the great importance of an adequate supply of sodium chloride in the body has long been realised there has hitherto been no clear understanding of the results of shortage of this substance. Dr. R. A. McCance, Miss E. M. Widdowson, and others, working with the support of the Council at King's College Hospital, set themselves to bring about a state of salt deficiency in normal persons severe enough to reproduce the conditions found in disease. Volunteers were given a diet containing practically no salt and were made to sweat profusely every day in a hot air chamber. After four to eight days most of them were reduced to a state of nausea, lassitude, and fatigue, sometimes accompanied by breathlessness on the least exertion. These symptoms closely resembled those of Addison's disease and the chemical changes in the blood were very similar. There was a reduction in the volume of the blood and extra-cellular fluids and interference with the normal action of the kidneys with accumulation of the products of nitrogen metabolism. These findings explain the importance of a generous supply of salt to workers in hot atmospheres such as deep mines and metal foundries, and also the need for abundant salt in the tropics. In this connexion it is of interest to note the function of the potassium ion in influencing the transmission of the nervous impulse both through the ganglionic cells and at myoneural junctions, recently disclosed by the work of Dr. G. L. Brown and his colleagues at the National Institute.

Nicotinic Acid

The career of nicotinic acid has been a chequered one and it forms another example of how an apparently trivial discovery of to-day may lead to one of great practical importance to-morrow. Twenty-five years ago Funk obtained this substance from rice polishings in his efforts to isolate the anti-beriberi accessory food factor and found it inactive in this respect. In 1936 it was shown by Lwoff and Lwoff and more definitely by B. C. J. G. Knight at the Middlesex Hospital to be an essential constituent of nutrient media for the growth of certain micro-organisms. In the past few months Elvehjem and his co-workers at Wisconsin University announced that nicotinic acid cured "black-tongue" in dogs, a condition which has come to be regarded as closely similar to pellagra in man. More recently Harriette Chick, T. F. Macrae, Sir Charles Martin, and A. J. P. Martin have found that pigs fed on maize and specially purified casein, on which diet they lost weight, developed diarrhœa, and died, could be cured by the injection of nicotinic acid or by adding this substance to their food. It remains to apply this discovery to the treatment of pellagra in man. It seems likely that nicotinic acid will prove to be an effective preventive and curative agent in this disease, but whether it is the only one is problematical. If it should prove to be the elusive pellagra-preventing factor, its place in nutrition is of the first order.

Cholera and Leprosy

Although the cholera vibrio has long been accepted as the causal organism of Asiatic cholera, its recognition has been coupled with doubts as to the best means of differentiating it from harmless vibrios found in man, in animals, and elsewhere, and it has been clear that an improvement in the diagnostic agglutination test for *V. choleræ* would be an important step towards the solution of these problems. In studying this test Mr. Bruce White of the National Institute found that the somatic or "O" antibodies alone possessed diagnostic specificity, the flagellar or "H" antibodies causing clumping also of the majority of vibrios from non-cholera sources. Dr. A. D. Gardner at the Standards Laboratory at Oxford reached a like conclusion. There was thus a prima-facie case for believing that O antibodies, evoked by antigens in which the non-specific H component had been inactivated, would effect a far sharper and truer differentiation of the cholera vibrio than sera of the mixed character hitherto employed. Recently consistent results in the recognition of *V. choleræ* have been obtained with adequately tested O sera.

The problem of leprosy has not received hitherto the close scientific investigation which it deserves largely because the causative bacillus had not been found to infect any of the lower animals which could be used for experiment. In their last report the Council referred to S. E. B. Balfour-Jones's success in transmitting the bacillus of rat leprosy to Syrian hamsters, and when Prof. S. Adler of the Hebrew University in Jerusalem visited the National Institute last year it was suggested to him that when he returned to Palestine he might try to infect these small rodents with human leprosy. This he has done and has found that the human bacillus readily infects the hamsters and produces in them a characteristic disease. These results if confirmed may provide the basis for an experimental attack on human leprosy by chemotherapeutic methods.

Comparison of this report with its predecessors shows an increasing preoccupation year by year with problems which have a direct bearing on clinical practice. Often it is apparent that the way had first to be cleared by experimental research; but a stage has evidently been reached in many branches of the work subsidised by the Council where more intimate collaboration between experimental and clinical workers has become practicable. We shall have further occasion to comment on different aspects of the fine work summarised in this report, which is as usual a model of convenience in format, style, and arrangement. Those who own to a prejudice against government publications should overcome it this year and spend three shillings on this one in the certainty that to anyone interested in the advance of medicine from whatever point of view it will prove enthralling.

MENTAL DEFECT

A CLINICAL AND GENETIC STUDY

THE first investigation undertaken under a scheme of research planned in 1930 of which the aim is to increase our knowledge of the causation of mental deficiency has now been completed.[1] Dr. L. S. Penrose has examined a large series of patients and has graded them according to their mental condition, studying also their family history and the mental capacity of their parents, relatives, and offspring.

The material for this study, which took approximately six years to collect, relates to 1280 patients admitted to the Royal Eastern Counties' Institution. The mental grades of all these patients were estimated by mental tests whenever possible; in cases of physical disability and very severe defect the mental age had to be estimated roughly by other means. Care was taken to grade each according to his abilities and not always to accept the legal definition of his state. From these measurements four defined groups of mental ratios were compiled as follows: 70 or above, dull, or within the range of normality, but liable to certification as feeble-minded when their behaviour is anti-social; 50–69, simpletons, usually certified as feeble-minded; 20–49 imbeciles; and 0–19 idiots. The family of each one of these patients was visited several times by members of the research staff and after all the available information about the family had been collected in this way, and from many other sources, an assessment of mental capacity was made for each relative. Indeed many children and adult members of the families were themselves tested. In this way reliable information was obtained about all the near relatives of 920 of the patients and the mental ability could be assessed in a large proportion of them. We have thus two pieces of information to collate—the mental category of the patient and the mental categories of his near relatives.

Mental condition of parents.—Of the parents of patients 7·6 per cent. were themselves mentally defective—i.e., were considered to be of a grade equivalent to or lower than that of the patients termed simpletons, 13·7 per cent. were dull (as defined above), three-quarters were normal. The proportion of feeble-minded parents was largest (12·1 per cent.) among the patients termed simpletons, least (2·7 per cent.) among idiots. In the general population the estimated proportion of defectives is only about 1 per cent., though in rural areas it may approach 2 per cent. In making a comparison between this standard and the incidence of 7·6 per cent. in the sample investigated, there is, of course, the risk of some exaggeration, in that defective children of defective parents may well be more readily placed in an institution than the defective children of normal parents.

Mental condition of offspring and sibs.—The offspring of patients in the series were too few to provide much data, but of 124 such children 56 lived long enough for their mentality to be fairly accurately determined. Amongst these there were 23 mentally normal, 16 dull, 11 simpletons, 3 imbeciles, and 3 idiots, in total a heavy percentage of abnormals. Sibs of patients formed a very much larger group, 6629 being ascertained. Of these 1 per cent. were of superior intelligence, 55 per cent. were normal, 7 per cent. dull, 7 per cent. defective. Of the remaining 30 per cent. 14 had died in infancy, 13 were stillbirths or miscarriages, 3 were untraced. It is of interest that the largest proportion of idiots is found among the sibs of idiots, that imbeciles occur most frequently among the sibs of imbeciles, simpletons among the sibs of simpletons—a clear correspondence between the grade of defect in the patient and the grade of defect discovered in the family. The amount of defect found in the grandparents of patients did not differ from what one might find in the general population but the available material is not very reliable. In general the incidence of defect is shown to vary directly with the degree of relationship.

CLINICAL ABNORMALITIES

In the second half of the report attention is turned to the clinical diagnosis. A very large proportion of the patients (972, or 76 per cent.) exhibited some clinical abnormality. For each group the mental grades of patients and relatives can again be defined. For example the families of *mongols* showed a much lower incidence of defect than that found for patients in general. Although the condition is usually thought to be distributed sporadically, this investigation revealed a number of familial cases, an observation which suggests that a genetic factor may be concerned in addition to the recognised importance of maternal age at birth of the child. *Cretinism* also, the results suggest, may be sometimes the expression of a Mendelian recessive character, although endocrine disturbance in general is not. A detailed examination of the sibships of *syphilitic* patients gives figures of interest. Before the mother's infection the children were usually normal; then came a wave of offspring dying in infancy, followed by the birth of the mentally defective patient; the next pregnancy was liable to yield a child of impaired mental powers and soon afterwards normal children would again predominate. This and other lines of inquiry point consistently to the conclusion that congenital syphilis can be a cause of mental retardation. *Epilepsy* was found to be one and a half times as common among relatives of epileptic patients as among patients' relatives in general.

CONCLUSION

Broadly speaking we find, therefore, from this very careful work first that mentally defective relatives of a patient resemble the patient in grade more often than would be expected if differences in grade were fortuitously distributed, and secondly that the disease of the patient also exhibits a familial concentration. Evidence in favour of Mendelian recessivity is found in phenyl ketonuria, cerebromacular degeneration, cretinism, deaf-mutism, microcephaly, and congenital diplegia. Dominance is observed in epiloia, neurofibromatosis, and Huntington's chorea. With most other physical abnormalities, and with the psychopathological states, evidence in favour of hereditary influences lies in their familial concentration, though, clearly, this is not decisive evidence. The probable existence of environmental causes of mental defect is demonstrated in mongolism, congenital syphilis, trauma, and encephalitis. In some instances environmental and genetic influences appear to act in unison.

Finally, for the benefit of those who are not satisfied with the author's novel approach to the problem or with his statistical analysis—and they should be few—the complete family histories are provided in an appendix of some 80 pages.

[1] A Clinical and Genetic Study of 1280 Cases of Mental Defect, *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 229. H.M. Stationery Office. 1938. Pp. 159. 2*s.* 6*d.*

MEDICINE AND THE LAW

Scarlet Fever as an Accident

A NURSE in an infectious diseases hospital has succeeded in recovering under the Workmen's Compensation Act for personal injury—namely, the contracting of scarlet fever while nursing at the hospital. The earlier stages of this case in the West Hartlepool county court were discussed in THE LANCET of Jan. 29th (p. 286). The applicant had suffered from arthritis and heart trouble as the result of the fever, and the judge has awarded full compensation at the rate of 20*s*. 3*d*. weekly from Nov. 12th to Dec. 12th, 1937, and subsequently 10*s*. 6*d*. a week on the basis of partial incapacity.

The case is of importance to hospitals and is of interest as reaching a decision contrary to that in Martin *v*. Manchester Corporation in 1912. In Martin's case the applicant was a porter in a scarlet fever hospital. He had influenza and returned to work. Nine days later, on April 1st, he was in the scarlet fever ward and also cleaned out the mortuary for the first time since his return. A few hours afterwards he was ill, and on April 5th he was found to have scarlet fever. He claimed that heart affection and nephritis followed the scarlet fever and that these disabilities were an injury by accident arising out of his work. The county court judge decided in his favour, accepting the view that Martin contracted scarlet fever when cleaning out the mortuary on April 1st. The respondent corporation appealed on the ground that Martin had not proved the day, circumstance, and place of the accident. It was not certain, said the appellants, that Martin contracted the fever in the hospital. In the Court of Appeal reference was made to two earlier decisions. Broderick *v*. L.C.C. (1908) was a case where a workman was held not entitled to compensation for enteritis ascribed to the inhaling of noxious gases in a sewer; Eke *v*. Hart-Dyke (1910) was a similar instance of poisoning ascribed to sewer gas where the work consisted of emptying out cesspools. Lord Cozens-Hardy, Master of the Rolls, asked himself this question: Is it or is it not the law that under this Act every hospital nurse or hospital attendant who contracts fever is entitled to say "I have suffered an injury by accident in the course of and arising out of my employment which entitles me to compensation"? "Emphatically I say 'No'," observed the Master of the Rolls; "there must be something more than that." The workman cannot recover compensation unless he can satisfy the court of the place and circumstances in which the illness was contracted.

The Court of Appeal found no proof that the body of any scarlet fever patient was in the mortuary when Martin was there on the day when the county court judge held that the scarlet fever had been contracted. The supposed infection on that day might be extremely probable; but it was not enough to say that, of the many chances Martin had of picking up the infection while working in the hospital, this was probably the one occasion when it happened. He was living in the fever hospital, working in the fever ward, and absent from time to time on leave elsewhere; there was nothing to show what was the particular occasion of infection. Lord Justice Buckley, in concurring, added that it was not enough to say "I was in a place where there was scarlet fever and I had scarlet fever and therefore I contracted it by accident." An accident was something more than the contracting of a disease. The workman must show how he contracted it. In the recent West Hartlepool case the county court judge has expressed himself as satisfied that the nurse contracted her scarlet fever in the hospital. She had entered upon her duties in the fever ward on Oct. 1st, 1936, and was found to be suffering from scarlet fever on Nov. 16th. How far the court specified the exact time and circumstance of the infection does not appear from the reports of the case at present available.

Unjustified Litigation

A fortnight ago at the Hampshire assizes there was a typical action of negligence against a doctor which, although ending in a rejection of the plaintiff's claim, must have caused considerable worry to the defendant. Mrs. Sprawton, conducting her own case, claimed damages against Dr. A. M. Dunlop on the ground of unsatisfactory treatment. She had met with an accident in leaving a Southampton tramcar when the road was under repair and had injured a leg and an arm. She did not send for the doctor at once, but, after staying in bed five days, went to see him. He advised the application of camphorated oil to her arm, she said, but he ignored the treatment of the foot. He had given her excellent attention on other occasions but this time she felt that she had cause of complaint. The only satisfactory treatment she had received was from a bone-setter. In her evidence she said she had obtained £21 damages from the Southampton Corporation but would have obtained more if Dr. Dunlop had been more careful in his diagnosis. In cross-examination she agreed that the accident occurred in October, 1926, and that the defendant had been her family doctor for 17 years and had treated her for various complaints, but she denied that she had been treated for acute rheumatism in the legs. She called two medical practitioners, each of whom, on entering the witness-box, raised the question of his fee. The judge explained to Mrs. Sprawton that the witnesses were entitled to be paid a professional fee before giving evidence and to refuse to be sworn if not paid. One of these witnesses said he had attended the court for four days and three guineas for each day was the least he could accept. The plaintiff was not in a position to pay this fee. The judge, after observing that it was extremely invidious to say what was a reasonable fee, said that he gathered that the plaintiff wanted to ask the medical witnesses what they found when they examined her and what treatment they recommended. Mrs. Sprawton then said she did not think their testimony would help her. Her daughter-in-law gave evidence that, before the accident, Mrs. Sprawton could walk well and had perfect health. This closed the case for the plaintiff and the judge naturally told the jury that, if they agreed there was no case against Dr. Dunlop, they should say so at this stage. The foreman said the jury would like to hear Dr. Dunlop's point of view. Dr. Dunlop said that this was the first time he had heard any suggestion of a fracture of the shoulder. Another witness, Mr. H. T. Nightingale, F.R.C.S., said he saw an X ray photograph; there was no fracture of the right shoulder and no fracture of the left foot. The jury found that there was no evidence of neglect against Dr. Dunlop. The judge, remarking that he felt bound to say he agreed, entered judgment for the defendant with costs. While we must all wish that every plaintiff, especially one who conducts her own case, shall feel that she has had a fair trial of her claim, this would appear to be one of those claims which should never have been allowed to harass a medical practitioner.

IRELAND

(FROM OUR OWN CORRESPONDENT)

SALARIES IN THE POOR-LAW MEDICAL SERVICE

DISCONTENT among poor-law medical officers on the ground of the inadequacy of their salaries is not a new feature in Irish medical affairs, and it becomes specially noticeable in any time of economic depression. The medical officer gets a salary of £200–£350 a year for attendance on the sick poor of his district. But of this he has to pay his travelling expenses; moreover, he has to reside in the dispensary residence for which the rent is often unduly high. He is expected to earn the remainder of a livelihood from such private practice as may come his way. In a good district and when "times are good" for the farmer he may have a comfortable, though rarely a large, private practice. In a poor district and when times are bad the private practice may be almost negligible, for many of those who would ordinarily pay the doctor's fees find it necessary or attractive to seek his services as "poor persons" and without fees. In some cases his income almost disappears for the larger the number of "poor persons" whom he has to attend the greater his travelling expenses.

The only remedy for the recurring discontent in this essential public service is that which the profession has long demanded—the establishment of a State or national medical service. This solution has been recommended by repeated Government commissions and committees any time during the last thirty years, but every Government has fought shy of it. At present the Irish Free State Medical Union is pressing claims for improved and uniform scales of salaries for the dispensary officers, and some weeks ago a memorandum setting out their case was submitted to the Minister for Local Government and Public Health, but he saw no useful purpose in receiving a deputation. Failing getting direct access the dispensary group of the Union has issued a circular letter to all members of the Dáil asking for their help in procuring a better scale of salaries. The claim is based on (*a*) increased work; (*b*) the lower salaries for dispensary medical officers than for other officers of local authorities; (*c*) increases in rent for dispensary residences; (*d*) decrease in private practice; and (*e*) the increased cost of medical education, including the post-graduate work necessary for a dispensary appointment.

A suggestion was recently put forward by the county medical officer of Meath, Dr. T. F. O'Higgins, which if adopted would do something to relieve the present dissatisfaction. The poor-law medical officer, in addition to his duties as medical attendant on the sick poor, is also, by virtue of his appointment, medical officer of health for his district. Formerly he was the sole officer in country districts, but the county medical officers of health who have since been appointed have a superior authority. For their duties in this capacity the dispensary officers receive a very small salary, varying from £10 to £30 a year. Many attempts have been made in the past to standardise these salaries at a reasonable figure, but the local authorities have been unwilling to pay more, and the Department of Local Government and Public Health has not been encouraging. Dr. O'Higgins has suggested that the salaries should be standardised at £100 a year, and that it should be the duty of the district medical officer to undertake such duties as immunisation against diphtheria and such other ancillary work as he might recommend to the local authority. The proposal has attracted both the local authority of county Meath and the medical profession of the county. If it were to receive general approval throughout the country it would do away with the present unpleasant impasse regarding payment for immunisation, and would make a substantial improvement in the emoluments of dispensary doctors. The Medical Union has invited its members in the different areas throughout the country to consider the proposal and express their opinions.

RESEARCH APPOINTMENTS

The Medical Research Council of Saorstát Éireann has appointed Dr. R. A. Q. O'Meara for one year to investigate the experimental production of therapeutic antisera; the work is to be carried out in the school of pathology, Trinity College, Dublin, under the direction of Prof. J. W. Bigger. Dr. J. C. Flood has been granted a part-time appointment for a year to study the total body electrolyte; he will work in the pharmacological laboratory, University College, Dublin, under Prof. E. J. Conway. Grants-in-aid have been awarded, for the purchase of apparatus or for research, to Prof. J. H. Biggart, Dr. P. C. Bresnihan, and Dr. J. D. H. Widdess.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

MENTAL DISEASES

CONTINUED progress in the institutions and clinics under his charge was recorded by Prof. D. K. Henderson in presenting the annual report of the Royal Edinburgh Hospital for Mental and Nervous Disorders. He said that public opinion is becoming better informed and more charitably minded towards the mentally ill patient. He stressed the danger of any attempt to divide physical and mental health into separate categories. Clergy and other lay persons have in recent years been tending to invade the psychiatric field, and if allowed to do so, they are likely to perpetuate the schism between the physical and mental which medical men have been endeavouring to heal. It is the physician alone who realises the risks and complexities of the treatment of highly charged emotional disorders. Prof. Henderson said that there can be no arbitrary division between the sane and the insane. Between the two there is a large group of people who are unable to adapt themselves to ordinary social life. The members of this group are very numerous, they form the most disruptive element in society, and we have no adequate provision for them. The development of a more positive health policy is likely to help this group. With regard to divorce and mental illness, Prof. Henderson said that one of the most disastrous and insidious forms of mental disorder has been deleted from the Divorce Bill, while other less serious forms are retained. He was referring to habitual drunkenness which, "both directly and indirectly, creates greater social disorder and distress than any other factor, and is one of the most difficult to treat."

PAYMENT OF HOSPITAL DOCTORS

As I have previously reported the directors of the Royal Hospital for Sick Children, Glasgow, consider that their medical staffs should receive reasonable remuneration for their services. In their annual report they stated that consultations have been

taking place with the directors of other large voluntary hospitals in Glasgow on the subject of more adequate remuneration for the physicians, surgeons, and other specialists who have given their services to the hospitals practically gratuitiously. It has apparently been agreed by these hospitals that the time has now come when definite steps must be taken in the matter. One reason they state is that local authorities pay their medical staffs in rate-aided hospital and if the voluntary hospitals do not do likewise they will not obtain the services of the men they might otherwise choose to fill vacancies. It is also pointed out how much heavier the demands made on the hospital doctors have grown. This change in the conditions of hospital staffing seems bound to come before long. At the present time junior physicians and surgeons holding salaried appointments in municipal hospitals hesitate to apply for non-paid appointments in voluntary hospitals which necessarily involve their sacrificing the salary they are at present receiving.

ABERDEEN ROYAL INFIRMARY

The amount of work undertaken by the Aberdeen Royal Infirmary has increased greatly since the new hospital was opened. The average number of beds occupied by patients during the year was 490 and nearly 28,000 patients attended the out-patient departments. A psychiatrical department, including a lectureship in psychopathology, is to be developed.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENT)

PUBLIC HEALTH AND MEDICAL CARE

THE Medical Society of the County of New York invited three speakers from the field of public health to address it at the New York Academy of Medicine on Feb. 28th. Dr. John L. Rice, health commissioner of the city of New York, described efforts of his department to raise the standards of its service. "All over the country," he said, "health departments have been vulnerable to a charge of mediocrity of service." This he attributes partly to the deadening influence of routine. To counteract this influence a training programme for personnel of the department has been carried through. The plans for encouraging the use of specific serum in the treatment of pneumonia include the establishment of a typing laboratory in each city borough and the appointment of a corps of consultants who are specialists in this form of treatment. The department has been criticised for establishing venereal disease clinics that are independent of hospital administration. Dr. Rice expressed his willingness to turn over these clinics as rapidly as hospitals are prepared to accept the responsibility for their administration. Tuberculosis is still a major public health problem. Mass X ray for case finding will be used even more than in the past. More hospital beds are needed. The city has a slum clearance programme which will it is hoped contribute to the control of tuberculosis. Increased attention is given to ensuring that defects found in medical examination of school-children do receive attention either from the family physician or at a clinic. Better facilities are provided for care of the prematurely born infant. Finally decentralisation of administration is fostered by the establishment of 30 health districts within the city. Ten new buildings have been completed for district health centres and two more are in course of construction. Progress, he concluded, also includes retrenchment in functions that are found not to be productive.

Dr. Haven Emerson, professor of public health practice at Columbia University, said that public health administration is preventive medicine as employed by government for social ends. It is done better, he holds, if care of the sick is excluded from this programme. An exception is allowed when insufficient care is provided for a communicable disease. In rural communities it may be the function of a health officer to organise though not to provide care of the indigent sick. Dr. Emerson deplored the duplication and extravagance of much work by the voluntary health associations. If these agencies, he said, would devote only a small part of their present efforts to making the civil government do a good job, many of their expensive money-raising campaigns would be unnecessary.

The subject of the health department's interest in medical care was to have been presented by the State health commissioner, Dr. Edward S. Godfrey, Jun. He was prevented by illness from attending, and Dr. George H. Ramsey, assistant commissioner for communicable diseases, spoke in his stead. The health department has been interested in medical care, he said, from early days. The terms prevention and cure are not sharply distinguishable. Quarantine lies partially in the field of curative medicine in that a diagnosis must be made or attempted before imposing restrictions. Organised health work in many parts of the country began not with environmental sanitation but furnishing medical services at public expense. Physicians were employed under the title "vaccine physicians" in Baltimore as early as 1821. Each physician so employed canvassed the district in which he lived searching for and diagnosing small-pox and performing vaccinations. The title remained official until as late as the charter of 1909. Dr. Ramsey referred to the inclusion in the activities of the New York State Health Department at the present time of a cancer institute, orthopædic clinics, and an institution for crippled children. The Detroit health department maintains a large obstetrical service at the Herman Kiefer Hospital. He added other examples of medical care supplied at present by health departments, and then dwelt at some length on the programme of his own department for the control of syphilis and pneumonia. Both of these programmes have included the provision of post-graduate medical education designed to improve the quality of medical care. Turning to the present more controversial aspects of the problem of providing medical care, Dr. Ramsey referred to the rapidly growing lay concern in this subject, manifest in the press, in the radio broadcasts, and even in commercial motion pictures. A flood of medical bills, some good and some bad, has been introduced at the present session of the State legislature. There seems to be no doubt of the need for medical care. Need differs from demand and supply. Dr. Ramsey drew attention to a curious interpretation of data in an editorial entitled A National Health Programme in the *Journal of the American Medical Association* for Feb. 26th. Referring to the National Health Survey, the statement is there made that families with incomes in excess of $3000 have medical care for 83 per cent. of the people, while relief families have medical care for only 70 per cent. The conclusion is drawn from these figures that if 17 per cent. of families with sufficiently large incomes to obtain medical care did not do so, the actual deficit for medical care not received by relief families was only

13 per cent. "The original figures in the survey report," said Dr. Ramsey, "refer to proportions of individuals with disabling illnesses, not to 'people.' Taking this fact into consideration, the inference from the editorial is that the 17 per cent. of the cases in higher income families did not need medical care even though each one disabled the patient for a week or more. At least in calculating the so-called 'deficit,' demand, not need, is considered." Dr. Ramsey characterised this attitude as ostrich-like although he admits that it is not new. Whether in high or low income groups, persons with disabling illness should have and be taught to demand medical care. The creation of this demand cannot be undertaken by the physician in private practice. Should the task of bringing under care all disabling illness now untreated be delegated to the public health services, Dr. Ramsey thinks it would probably be undertaken by greatly broadening education activities and in particular the work of public health nurses "who on each visit are directed to look for other medical situations than the one specifically prompting the visit, and to urge and arrange for treatment if apparently needed."

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM VRATCH

III

ONE evening just after tea in the middle of winter, the servants in my hospital in a Russian village came to tell me that a peasant wished me to pay a visit. A snowstorm was blowing up so I knew the matter was serious. In the hall a dejected peasant was standing waiting. He asked if I would go to a woman who had been delivered four days before, but was desperately ill. When he told me it was his wife a chill struck us as if the felt-covered door had blown open and let in the cold air. We were accustomed to tragic news from those thus fearing bereavement; but in addition these words conveyed to us the fact that the snowstorm now raging was so terrific that the poor fellow could not persuade any relative or friend to face it. Though she was dying he had had to leave his wife and himself risk even disaster in getting aid. I made only one stipulation, that after my work for his wife was done he must get me driven back for the hospital duties next morning. He agreed and we set out.

As a sensible person when rations are uncertain will stuff into himself as much as he can eat, to make up for depleted reserves and lay in a provision for the future, so any sensible traveller leaving a warm stove and wrapped in sheepskins, still warm from the cupboard, would snatch a period of sleep before the frost began to cause distress. By the time the sledge had reached the end of the village I was asleep. It was an uneventful twenty miles. The night was terribly cold but it did not break through my layers of fur. Innermost was a close-cropped sheepskin lining to a sort of melton great coat, outside of which was a coat of long-haired sheepskin, not buttoned but held together with tied thongs. Over all was a garment transcending tailors' terminology, shaped to be sure like a coat but so large that thirteen sheepskins had gone to its making. This vast envelope, showing to the world the white inside of the pelts, was kept in position by a girdle curiously patterned and woven in scarlet and white, half a yard wide and four or five yards long—a present from a grateful Tartar—wrapped round the belly of this mountain of hides. The collar when open fell over the shoulders like a mantle; when closed it crossed over the face and stood up like a conical dome over its wearer's head and was kept from falling by a narrow hand-woven braid tied in front with a bow knot for quick release in case of being pitched head first into a snowdrift. The feet are protected with stockings made of camel hair, thick as blankets, and the legs are thrust into knee-high wide felt boots; there must be no pressure for if skin circulation is stopped even over a small area the result is frost-bite, and (since it may in the recoverable stage pass unnoticed) necrosis. It was indeed wise therefore to get one's sleep while one was still warm.

* * *

When I unpacked the instruments in the patient's house the skin of my hands froze to the cold metal, after which warning I handled them through a towel to prevent a "cold-burn." The patient had been delivered of a dead child and some of the placenta had stuck. The village gamps had been at work with unwashed hands and a teaspoon; these measures proving unavailing the old women had used an S-shaped thick wire lamp-hook, rusty and besmeared with greasy soot. The lacerations produced by its use were dreadful.

The professional situation was a delicate one. If I told the gamps what I thought of their methods and of their choice of implements I should make enemies of them, and as I had to leave the patient in their care it was desirable to obtain their friendly assistance. As for instruments, I doubt if there was such a thing in the whole village as a metal tablespoon (whose handle might have served). The lamp-hook seemed to me inexcusable; however it must be remembered that when face to face with a crisis, and ignorant of the least thing that will remedy the condition, when fear benumbs the mind and one loses contact with one's experience of past difficulties and the way to overcome them, then with nearly all of us a stupefying hate surges up, and the crudest and most violent actions are performed in place of more gentle and skilful ones. I was half sorry for that huddle of shrivelled old women as they passed the hook from one to another, showing it to me as if they felt caught in an evil confederacy and could only excuse their action by giving it the semblance of a joint undertaking. Perhaps it would have been wiser to use their services but I could not trust their obedience; so they were sent to borrow samovars and prepare boiling water, which they could not very well infect.

The details of the gynæcological operation are immaterial. I had to sterilise the instruments three times because of the crawling infestation of cockroaches which ran over the table and dropped from the ceiling. (Cockroaches live on bugs, by the way, so many peasants prefer them in the house; but I, who grow quickly immune to bug bites, prefer these to the restless, rattling scurrying of cockroaches over face and hands when sleeping in the peasants' huts.) I organised as helpers the girls of between 14 and 18 who had been to school, hoping thereby to instil,

though it be only by a few hours' example and instruction, something of the need for care, cleanliness, and gentleness of touch in these affairs. The village appeared to have about five or six girls of the right age and educability to choose from; they were all given duties.

Eventually the exhausting business was done, and I asked for food. No! I could not have food, did I not remember it was a fast day? I begged for it, said it was near midnight and I had to drive back to the hospital at once (they shuddered); I implored them to give me hot milk, eggs, and bread, saying that the priest had allowed me to give the indulgence of fast-breaking to patients physically in need of food, and I would make it right with their priest if they would give me some. They were adamant. Then I thought of a ruse. I moved the instruments into the kitchen and said I must pack them up by myself. They readily agreed, but realising I was going to steal some bread moved every eatable from the place first. For my comfort perhaps it would have been better if I had employed those old women round the instruments and the bed rather than in merely boiling water in the outer-world of the kitchen; for it was they who raised objection to my taking food, in the belief, I imagine, that it would go ill with the patient if I did.

After seeing about a dozen other patients in the village ("since you are here, doctor!") the patient's brother this time and I set off on the return journey still supperless.

* * *

There are two kinds of snowstorm: there is the fluffy kind we have in England, in which snowflakes fall gently sloping through the breeze and delight us with their cool moist dabbing, and there is the burran. It is not only snow that falls in a burran, but also ice-crystals that have lain and hardened on the ground are picked up by the wind and hurled through the air. The flying ice lashes the skin so that to the pain of cold there is added the torturing bombardment of these sharp, hard particles.

Within half an hour of our departure a burran in full strength was upon us. Swiftly it penetrated layer after layer of those sheepskins and the heat of the body felt powerless to meet and throw off the onset of cold. Exhausted with the night's work, which besides being medically tricky had been socially difficult, I found myself overpowered with sleep. I seemed to be travelling in a curious luminous blue haze; it was cold of course but not unpleasant. Sensation was becoming numbed, indeed for some reason being a tiny island in an ocean of cold was not a bad experience. I began to feel an interest in sensations again, the blue haze was rather fascinating and there were faint lights floating or revolving before my sightless gaze. It was quite pleasant to watch their movement which one felt might go on for ever and for ever. Suddenly the faint lights raced in circles and exploded, and at the same time I heard a crash in my skull. I came to with the sledge on top of me in a snowdrift. I had fallen asleep, and so, I imagine, had the driver. In the upset a shaft had been broken.

It is a weary task to mend a sledge shaft by day in still air, there are never any tools but an axe and always too little rope; but in a burran at night it is torture. The ropes are stiff with frost, the fingers get so cold that they will not bend to grip the shaft pole, still less the thin hemp cords, and every movement of the limbs is hampered by the mattress-thick layer of sheepskins that one dare not throw off lest the low temperature congeal the muscles into immobility. However, the shaft was mended at last, the horse put back, and on we went; but soon we overturned again. The splice had worked loose, so that the pull of the sledge on the animal becoming suddenly lopsided, he had been thrown one way and we another. Again the struggle with the shafts and cords, and again the horse was put back into harness; but now its nerve had gone and it would not move. So by turns we walked at its head, tapping the snow with the butt of the whip to feel it solid under foot, patted the animal's nose, talked to it, and led it along yard by yard. Thus we progressed for I judge about an hour. At last the horse took to trotting without being led so we both got into the sledge and once again I dozed off, to be woken up by the stopping of the sledge. We had gently slid into a drift. The driver, having now given up hope, fell on his knees praying, and asked me to join him; "We will pray and then die." At this craven and fatalistic suggestion I flew into a rage and knocked him down, asking how he dared to talk about dying, and besides we were pledged to be back in the hospital at eight o'clock in the morning! Then I dumped him in the sledge and tried to stir up the horse. The poor creature was immovable; and although it would obey its master better than it would me I could not trust the peasant on the snow lest he started kneeling again, so I had to lead the horse myself using both the coaxing language and also some of those half-Oriental curses which keep Russian horses on the move. By whichever persuasion the animal finally started to trot, so I got back into the sledge for a rest.

But the driver now seemed to have lost his reason. He kept on repeating "It is foolishness to go on; better die, better die!" Every time he yielded himself to the thought of death my anger was roused afresh; each appeal to resignation was responded to with curses and blows. Under this treatment his view changed; I ceased to be human; it was obvious, he told the Deity, that I was a devil under the protection of Satan. The villagers had rightly called me "The Great White Devil" (a name I had regarded as an endearment and had ascribed to my large outer coat); it was obvious, he went on in a sort of mixed prayer and conversation with God, why the church bells were never rung for me to guide me when I was out in a snowstorm, the reason why I was thought to be indestructible was now clear—the devil looks after his own. Alternately praying to God and cursing the fiend in the sledge behind him he jogged the horse along.

When he was silent I feared that he had resigned himself once more, so I stirred him up with kicks and oaths, knowing from my experience of anger at him how warming it was! So hour after hour passed in the cursing and fighting of two half-frozen mortals moving painfully over a vast empty expanse of snow under a canopy of hurricane and ice.

At length we saw stacks and hurdles and other outposts of human habitation. It was a Khan on the track of a Tartar trade route. So far from our proper and ordinary road were we that I had not even known of the existence of the place. In the starlight we stumbled over sledge ropes and bumped into squatting camels in the courtyard of the Khan; it was good to hear their contemptuous guttural grunts (though Russians loathe them usually). We burst into the great kitchen, hot as an oven, where a score of Tartars and Kirghiz were snoring in their shirts. We took off our sheepskins, held the inner ones against the walls of the oven to warm

them, and then, putting them on hot, lay on the floor for an hour's sleep.

* * *

The last few miles to the hospital were the worst. After a certain point has been passed the experience of freezing is not painful; the reverse process is an agony of mind and body. The hour's baking in the Khan had been the turning point, so that now, though dawn was breaking and the world was beginning to reshape itself as some external thing that would have to be dealt with, I felt that the task was insupportable through lack of inner strength, and that the pain would go on and on and the spirit sink down and down to an unstruggling and inevitable eternity of suffering. Eventually we arrived at the hospital compound, and when passing under the gable end of my house I saw a Siberian crow, which had wintered under the eaves and which I had always looked for with pleasure every morning, frozen dead on the ground. I suppose that the 87° F. of frost registered that night had been more than it could endure. The sight of its stiff body was a shock, but I thought "I am glad of it! If I know that it is dead I know that I am alive!" In some way that ruthless life-greedy thought produced a change in my mind.

* * *

The servants on our arrival were not sure whether it was us or our ghosts; I soon proved which view was correct, for by good fortune a ham had been boiled and was still in the pot, steaming hot. I ate such slabs of it as I thought not possible for a mere human to consume. But it made no difference; though I knew I was alive my body still felt dead. The hot meat within soon seemed to cool down to the corpse-like temperature of my body; nothing seemed to give the feeling of heat and inner life which sustains our courage and gives a feeling of health though we do not realise this until it is lost. Three times that day the fires were lit in the great stoves and I would have had them relit again but the servants refused lest the over-heated stoves burn the house. My table and bed were moved against them, but without effect. For nearly a day my skull felt like a helmet of cold steel under a layer of tepid and scarcely living flesh, the ribs were a chill cuirass which seemed to frost the drawn-in air, the long bones of the arms and legs felt like cold iron bars inserted between the muscles, heavy and chilling *from the inside*. The horse was laid up for a week and it took the driver two days to recover.

The silly fellow immediately on our arrival and before taking to his bed went among his acquaintances in the village and spun them an astonishing tale of the horrors of the night; but it was not the agonising pain of straining to bend frozen fingers round the shaft and gripping the stiff ropes to lash the broken ends, not the misery of that isolation in the very heart of coldness, no, nor the condition of his sister for whose sake the journey was taken. These were things of this world in which pain is natural. His tale was of having driven a devil who moved under the protection of Satan. I walked across from my house to the hospital at 8 A.M. to start up work as usual; but this moujik with his yarn had so diverted attention from physical ills to far more interesting metaphysical-theological questions about demons and their like that at first I got nothing from the patients but gaping stares; but soon reluctantly, apologetically even, (I am thankful to say not timorously—that nickname was not really taken seriously), they began as usual to tell me of their ailments.

Later I heard that the woman died.

PANEL AND CONTRACT PRACTICE

Juvenile Contributors under the New Act

UNDER the provisions of the N.H.I. (Juvenile Contributors and Young Persons) Act, 1937, which comes into operation on April 4th, boys and girls who leave school and become insurably employed will be entitled to medical benefit, but not to sickness or disablement benefit until they attain the age of 16. Already approved societies are obtaining members from among these young people, and are sending the necessary notifications to insurance committees, who are preparing medical cards which will be issued early in April in respect of those who have taken advantage of the opportunity to become members before they have actually begun to contribute. Each "first" medical card issued to juvenile contributors will contain a message from the Minister of Health.

It is however unlikely that more than a small minority will apply for society membership before they begin to contribute, but medical benefit will be available for all of them as soon as they become insurably employed, and it is likely that some will require medical treatment before they have had a medical card issued to them—which will not happen until the insurance committee becomes aware of their existence through the society concerned. Contributors who have not joined a society will be able to obtain a temporary medical card by applying to their local insurance committee and submitting evidence of insurable employment, such as a contribution card bearing insurance stamps, or a certificate from their employers. Even if they have not obtained a medical card treatment should be given when required if they claim to be insured, but under Clause 7 (2) of the terms of service the practitioner concerned may charge a fee by way of deposit provided he gives a receipt on form G.P. 4 for any fee so charged. As juveniles will not be entitled to receive certificates of incapacity until they reach the age of 16 insurance committees have been told that it would be of assistance to practitioners if the words "not eligible for certificates before . . ." were stamped on the front of the medical record, and the date of the 16th birthday entered in the blank space before issue of the records for juvenile contributors.

To provide for its equitable distribution the practitioners' fund for 1938 will be divided, 24·25 per cent. being distributed for the first quarter and 25·25 per cent. for each of the other three quarters. Arrangements are also being made to ensure that practitioners in rural areas who are required to dispense for their patients will receive special credit for the second quarter in respect of any juveniles concerned. Some practitioners whose lists are at or approaching the maximum number of insured persons may desire an increase in the maximum to enable them to accept applications from juvenile contributors, and the Ministry have suggested that this can be best effected by the exercise by committees of their power of making special exceptions to the normal limitation, with the approval of the Minister, under the allocation scheme. This does not necessarily mean that a permanent increase will be permitted.

SCHOOL RECORDS

A circular (Form G.P. 90) is being issued to each insurance practitioner drawing attention to the provision made under the Act for enabling a practitioner to obtain such particulars of the school medical record of any "young person" whom he has accepted for treatment as he may deem necessary for proper treatment. The information can be obtained from the local education authority in possession of the record, either by direct application or through the insurance committee, and will in either case be supplied direct to the applying practitioner by or on behalf of the school medical officer. A simple form, of a size to fit into the form of medical record, has been devised whereon the applying practitioner will insert the name and other particulars of the young person, including details of the last school attended, and this will be returned after the appropriate data of school medical history have been inserted. The hope is expressed in the circular that practitioners will make a habit of including this form within the insurance form of medical record, so that it may be available for reference both by themselves and by any other insurance practitioner to whom the insured person (and his medical record) may at any future time be transferred. The school medical records themselves vary so much in size as to be quite unsuitable for transmission, and this form provides a convenient way of linking up the school medical history with the later clinical history. A negative history will be as useful as a positive one.

CORRESPONDENCE

REST AFTER OPERATIONS

To the Editor of THE LANCET

SIR,—My remarks at the meeting of the Medical Society of London were intended solely as a contribution to the discussion of the causes and treatment of flatulence. My contention, which was clear to those present, was that a fluid diet and even strict confinement to bed were not only unnecessary (after a clean muscle-splitting abdominal incision) but actually favoured the production of flatulence. I used the words "In young and otherwise healthy people" as a preface to these remarks, thus excluding neurotics and those who like to feel that this much-vaunted rush of modern life is telling on their nerves. If any psychological trauma is occasioned by operations such as I quoted its effects will be enhanced by confinement to bed, by riveting attention on a trivial ailment. When by the third day is added a rumbling of the bowels and abdominal distension is it surprising that the victim becomes gloomy if not even hysterical?

Conversely, to allow the patient, if he feels so disposed, to sit up the next day and even walk about a little restores the operation to its correct position of importance, prevents the loss of vasomotor tone responsible for the exhaustion of convalescence and, in conjunction with a solid diet, obviates post-operative flatulence. There was never any suggestion that patients should be forced to get up against their will. If he is of the type Dr. Seymour Price has in mind he will far more quickly recover mental and physical health by these means because he will the sooner leave the nursing-home and thus enjoy the benefits of country or seaside convalescence earlier and for a longer period. Those who indulge in an unnecessary appendicectomy as a temporary escape from marital infelicity or other environmental difficulty form, I admit, an exceptional group. The discussion was, however, on flatulence. This according to Dr. Seymour Price can be either prevented or cured. Many of my fellow members will share my regret that he was not present to tell us how.

I am, Sir, yours faithfully,

A. H. DOUTHWAITE.

Harley-street, W., March 12th.

TOWARDS CADAVER BLOOD TRANSFUSIONS IN WAR

To the Editor of THE LANCET

SIR,—With a view to using cadaver blood for transfusions in the front hospitals in Spain, I have made certain preliminary examinations in order to test its qualities. Conditions of work did not allow this check-up on Yudin's work (*Lancet*, 1937, **2**, 361) to be more than a brief indication that the method is both practicable and valuable. The work was done under the constant and disturbing threat of air-raids, and mostly out of touch with the laboratory and in the midst of other medical work.

Five cases were examined, all young men between the ages of 20 and 30. In the first four nothing further was established than that in these cases of sudden death the blood did not coagulate in the manner usual with living donors. In the fifth case a large quantity of blood was collected but circumstances made it impossible to ensure asepsis or effective refrigeration.

CASE 1 died of internal hæmorrhage within three hours of receiving a bullet wound of the chest and abdomen. Ten minutes later blood was removed in a sterile syringe and put into a sterile test-tube. Three hours later slight retraction of the corpuscles from the side of the tube leaving clear serum indicated the beginning of clotting. Slight agitation caused this to disappear, and not to reappear. Three days later the blood was still completely liquid. This was the first indication we had had of the existence of "fibrinolysis."

CASES 2, 3, and 4.—Bombing of the village left three men buried in a cave. Asphyxiated, they were brought dead to the hospital. Four hours later blood was collected from each as above. It remained liquid for a further eight hours, after which it had to be rejected owing to removal of the hospital.

CASE 5 died in the ambulance on the way to hospital of severe wounds of the head and abdomen caused by a shell. The shortness of time after death of examination is indicated by the rectal temperature which was 98·4° F. The immediate cause of death appeared to have been hæmorrhage. There being a momentary lull in the work, and our laboratory being available, I obtained the coöperation of Dr. Barsky and his surgical staff for the extraction of a larger quantity of blood, which I hoped might be used in a transfusion, after the necessary examinations. The special material needed for the extraction though simple was not available. An attempt, however, was made to sterilise a 4-litre bottle, keeping it for five minutes neck downwards in a jug of boiling water. A piece of rubber tubing about 5 mm. in diameter and 1·5 metres long was sterilised by boiling. The head being held over to the left, with normal sterile technique, a long incision was made along the anterior border of the sternomastoid, which was retracted outwards and backwards, and the carotid sheath found and opened. The internal jugular vein was separated and two ligatures passed round it. The upper ligature was tied, the vein opened, and the rubber tube passed some 10 cm. down the vein towards the heart. The second ligature was used to tie in this tube. The other end of the tube was placed in the bottle. The foot of the table was then tilted up to an angle of about 15° with the horizontal. The blood began to flow,

and the flow was increased by massaging the legs. Some of the blood was transferred to two sterile test-tubes; 700 c.cm. was obtained in all. One tube was sent to the travelling laboratory and examined by Jean Picone two days later. The other tube and bottle were kept in water at a temperature of 40°–50° F. in the absence of a refrigerator. The blood did not coagulate, but that in the bottle was badly laked within two days, and so was obviously unsuitable for transfusion. That in the test-tube remained unhæmolysed for a fortnight and was then discarded. The laboratory report on the smaller sample was as follows: Sedimentation-rate in Westergren tube after 1 hour, 2 mm.; after 2 hours, 4 mm.; after 3 hours, 7 mm.; after 24 hours, 41 mm. Meinicke and Kahn reactions negative. Red and white cells normal in quantity and appearance. A few cocciform bacteria seen, due probably to imperfect asepsis or sterilisation of instruments and apparatus used. The appearance of the plasma after spontaneous sedimentation slightly hæmolysed.

It is hoped that when time permits we shall be able to get the necessary material and organisation to be able to collect cadaver blood aseptically, to keep it in a refrigerator, and to use it in transfusions. The advantages of this blood appear to be: (1) it does not need an anticoagulant and therefore can be used in large doses without fear of toxic effects; (2) it could be made available during military operations on a large scale; (3) it can be obtained without any question of endangering the health of the donor; and (4) possibly it keeps longer without autolysis than citrated blood owing to its unadulterated state.

I am, Sir, yours faithfully,

R. S. SAXTON.

Servicio Sanitario 35E, Albacete, Spain, Feb. 14th.

SPA AMENITIES

To the Editor of THE LANCET

SIR,—During a visit to Czechoslovakian spas last autumn I noticed a feature of one of its spas, Pistany, which offers an example that might well be followed in this country. Besides the first- and second-class baths is a third-class establishment named "Pro Patria." This is a very large institution built on the block system and accommodating 600 people with residence, board, and treatment. The beneficiaries consist of two classes: (1) insured members of friendly societies and of State railways, and (2) soldiers. I paid several visits to this establishment, the most interesting of which perhaps was during the serving of the midday meal. The large, light, and airy kitchens, the white-uniformed staff, the spotless cold-storage plant, and the appetising smell and taste, and the manner of service of the various dishes were impressive. The establishment of this kind of institution at British spas would be a boon to many patients; at present a hospital patient who needs resident spa treatment has first to collect the necessary funds, and this often proves an insuperable obstacle. For those who can afford to pay a certain amount there are provided at the "Napoleon" second-class baths; the actual administration of the treatment and even the surroundings are hardly distinguishable from those of its more expensive neighbour, the "Irma." Associated with these second-class baths is hotel accommodation at the "Cyril" where for modest charges bedrooms containing one, two, and three beds can be secured. Each room resembles in its make-up the most modern of nursing-homes, and the usual hotel lounge and a dining-room are available as common rooms. Its residents are partly "private" visitors and in part drawn from the higher grades of insured employees. There is a flat-rate charge of 110 K. a day (7 K.=1*s.* in English currency in September, 1937) for everything, including medical services. The most expensive establishment the "Irma" is literally part of the Thermia Palace Hotel, and the treatment is therefore administered for those staying at the hotel as conveniently as by walking from one's bedroom to the bathroom along a hotel corridor.

The three main bathing establishments lie on an island which is formed by a fork in the River Waag, and the hot sulphur and "radio-active" mud, volcanic in origin and largely mineral in content, as well as the hot springs are made use of for packs and baths almost as they emerge from the earth. All the surroundings are extremely well planned. At the back of the "Thermia" is a square courtyard sheltered from the sun by spreading trees and large enough for dancing in the summer evenings, beyond this a sunken garden, and beyond that again the Waag. Running from the hotel front are long tree-sheltered walks, leading to a nine-hole golf course, an open-air swimming pool, and, further off, the aerodrome, whilst the rest of the island is planned on similar pleasant lines. The town itself, on the opposite bank of the river, contains, suitably, no excitements, and part of the country is drab; part, though, is covered with hilly forest land.

At each of the three other spas in Czechoslovakia that I visited last year there are features of which we could usefully take note in this country. Karlsbad, which can be reached direct by air in a journey that involves little fatigue, lies in a hollow with beautifully wooded surrounding hills; part of it is extremely primitive but one long street is a combination of Bond-street, the Bois de Boulogne, and the more picturesque parts of Torquay. I purposely avoided the luxurious hotels at Karlsbad, and found in Joachimstal modest ones with reasonable charges, unexceptionable food, service, and a *private bathroom*. At Marienbad I stayed at the luxury hotel, the Weimar, and was impressed by its high quality and the beauty of its surroundings. The actual charges are always obtainable in advance from the municipal authority.

I am, Sir, yours faithfully,

Harley-street, W., March 10th. R. S. WOODS.

A RECTAL PLUG FOR PILES

To the Editor of THE LANCET

SIR,—In your issue of Jan. 15th (p. 141) Dr. St. John Lyburn described a wooden plug he had designed for the application of pressure in the injection treatment of hæmorrhoids and prolapsus ani. I feel it would be worth while publishing an experience of my own in this connexion. Last Easter when away on a holiday I was called in an emergency to see an elderly lady with thrombosed piles prolapsed through the anus. They could be reduced digitally but came down again at once, and it struck me that if they could be held up in position the condition might be relieved and fibrosis might take place naturally. A pad held against the anus was useless, so I attached the larger end of a small cork to a bandage and inserted the cork lubricated with vaseline through the anus, keeping it pressed up by attaching the bandage to a band above the hips. The result was entirely successful, and the patient has not complained of anything since. On coming back to London I found that various plugs had been devised for this purpose; but the dimensions and shapes did not seem entirely satisfactory. Messrs. Down Brothers have now made an apparatus for me which should answer the purpose.

Dr. Lyburn uses his plug after treatment of the hæmorrhoids by means of injection; but I feel that if it was used in the first place injection treatment and even operation might be avoided. One type of plug is called the "Little Wonder," and I see that Romanis and Mitchiner suggest that this should be rubbed up and down and that it may be successful in slight cases by irritating the mucosa and so causing it to fibrose. Like Dr. Lyburn I would suggest that continuous application is advisable and that even comparatively severe cases may yield to this treatment; but further experience is desirable.

I am, Sir, yours faithfully,

London, W., March 11th. E. P. POULTON.

THE WEEK-END HABIT AMONG DOCTORS

To the Editor of THE LANCET

SIR,—Let nobody accuse me of having anything but the greatest respect and affection for the medical profession; I seem to be a lay member of it. It is this that makes me take up the cudgels when I hear the profession abused. I have just had to do so, but I am bound to confess I felt that there was a fair substratum of truth in the accusation. It was this: that doctors in these days take little interest in saving the lives of their patients, that they treat the whole thing as a business and show little or no appreciation of the anxieties of the patient or the relations. I have been brought up to see that the doctor's life was one of great personal sacrifice; but to-day I do not see so much of this, I hear and know how surgeons who do serious operations on a Thursday scuttle away for a week-end on Friday night, leaving the patient in the nursing-home or hospital to the care of others. I know that it is now a common thing for general practitioners to take week-ends, or days off each week, and leave their patients to rip or to call in a partner if they feel desperate. If there is no partner, the patient has to lump it; etiquette forbids calling in anybody else.

I am aware that since the Great War death is now looked upon, in what may best be described as a very casual manner, by a large number of materialists. But let the medical profession take to heart that it is in times of dire sickness that they are on their mettle, that they are expected to do all that in them lies to ward off death, and that it is then that, however much they know themselves to be up against the inevitable, to the lay mind our knowledge of disease and its cure seems to have progressed so little. That is the view of the patient and the relatives. Without sacrifice, without a deep sympathy, medicine is a common business.

I am, Sir, yours faithfully,

ERNEST GOODHART.

Gloucester-terrace, Hyde Park, W., March 15th.

WATER-BORNE TYPHOID

To the Editor of THE LANCET

SIR,—The article by Dr. Duncan Forbes in your issue of March 5th, which, if he will allow me to say so, is one of the most sensible and helpful that I have ever read, prompts me to refer to another factor in typhoid infection. I go back to the excreta of the patient before they get into the water-supply. While there are unrecognised cases in private practice—I have notes of many seen in consultation—it is safe, I think, to say that the bulk are notified and removed to hospital. Then the procedure varies. In large towns with thoroughly controlled water-supply and sewerage, both on a big scale, it may be that the risk of emptying untreated excreta down the drains is negligible in regard to infection of the population, but that is a matter for the M.O.H.

On the other hand, many cases are treated in small isolation hospitals in places where control of the local water-supply may be difficult. In such circumstances I submit that it is not justifiable to put infected excreta into the hospital drains or to discharge a patient until there is reason to believe that his excreta—fæces and urine—no longer contain typhoid-paratyphoid organisms. That can be done quite easily by allowing the excreta to stand in a well-ventilated annexe or even out of doors in contact with a reliable disinfectant for one hour before they are emptied into the drains. While handling them, the nurses should wear stout rubber gloves of the cheap "domestic" variety. It is essential that the disinfectant should have a high coefficient against typhoid bacilli and that its action should not be markedly inhibited by the presence of organic matter.

Secondly, the fæces and urine of convalescents should be bacteriologically examined and the patients detained until the results are negative. Then remains the problem of the carrier. If the excreta still contain these bacilli at the end of two months after the temperature has been normal and there are no complications, I submit that such a person should be regarded as a carrier and the drains protected, secluding him until he is no longer a potential danger. In prolonged cases, removal of the gall-bladder seems to be the only effective measure. Let the problem be dealt with at its fountain head.

I would add that in private practice doubtful cases should have their excreta disinfected. Given rubber gloves and intelligent nursing there should be no difficulty in this. The danger lies in the patients being labelled "gastric influenza," or perhaps "ptomaine poisoning."

I am, Sir, yours faithfully,

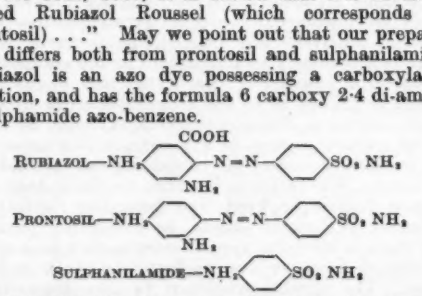
A. KNYVETT GORDON.

Bedford-square, W.C., March 11th.

THE FORMULA OF RUBIAZOL

To the Editor of THE LANCET

SIR,—In an annotation on p. 1152 of your issue of Nov. 13th, 1937, it is stated that Dr. de Léon "used Rubiazol Roussel (which corresponds to Prontosil) . . ." May we point out that our preparation differs both from prontosil and sulphanilamide. Rubiazol is an azo dye possessing a carboxylated function, and has the formula 6 carboxy 2·4 di-amino 4 sulphamide azo-benzene.



Sulphanilamide is, we understand, the generic term applied to para-amino-benzene-sulphamide, which is a white body without any azoic molecule. Prontosil differs from rubiazol in that it does not carry the COOH group. We believe that the particular formula of rubiazol enables it to possess a high chemotherapeutic coefficient which results in certain clinical advantages—e.g., its high activity at low doses, and its freedom from clinical manifestations of toxicity.

We are, Sir, yours faithfully,

ROUSSEL LABORATORIES LTD.

Cavendish-square, W., March 9th.

LUMP-SUM SETTLEMENT OF COMPENSATION CLAIMS

To the Editor of THE LANCET

SIR,—Mr. H. Ernest Griffiths in your issue of March 5th gives the result of a three-year follow-up investigation carried out in New York of 322 workmen whose claims for incapacity from accident were settled by a lump-sum payment of *£200 or over*. Of these, under 3 per cent. had made a complete recovery; of the rest about 100 men had been able to resume their pre-accident work or similar work, and about 83 had remained unable to obtain any work, whether or not they could do any. The remainder (about 117) had obtained work of a kind inferior to their pre-accident work.

These figures do not appear to argue against lump-sum settlement from the workman's point of view; for, in view of the size of the settlements, they would embrace only cases that must have been considered severe and likely to have some permanent or prolonged reduction of wage-earning capacity. The employers, in fact, might feel that they had been over-generous when, after paying weekly compensation and a sum of £200 or more in final settlement, one-third of the recipients were able to resume their pre-accident work.

Of the 64 "neurotic" cases only 17 (27 per cent.) were employed, and "only 17 of the 64 had received any positive stimulation from the settlement"—whether the same 17 is not stated. Such figures are not helpful except to show that all "neurotics" are not malingerers or hysterics. They would be of more value if the "neurotics" had been classified by a competent psychiatrist according to the nature of the mental disorder present, and if it were stated whether or not they had had skilled treatment. Obviously a settlement would not benefit a manic-depressive or a schizophrenic, or even an anxiety state unless its basis was an anxiety that could be dissipated by a sum of money alone; and these are few. Accident (or shock) is readily accepted as adequate cause for a continuing mental disturbance. This is never the real state of affairs. After psychological diagnosis must come psychological treatment in suitable cases, and not merely the application of "golden ointment." Unfortunately skilled investigation and treatment is rarely afforded to the "neurotic" in industry, while physical defects are always thoroughly treated—sometimes over-treated.

The argument against lump-sum settlement on the ground of the inability of the recipient in the majority of cases to put it to successful use is formidable. But I doubt whether the suggestion of a weekly allowance for a specified time would be suitable except in slight and fully recoverable cases, with which the statistics produced scarcely seem to deal. The best solution would appear to be the administration by a trustee of all settlements above a certain figure.—I am, Sir, yours faithfully,

B. BUCKLEY SHARP.

Harley-street, W., March 15th.

PUBLIC HEALTH

Safeguarding Water-supplies

IN a communication to local authorities and other water undertakers the Minister of Health reminds them of their statutory duty under the Public Health Acts or other Parliamentary enactments to ensure that their water is wholesome. Undertakings, he says, should be under the supervision of qualified engineers. Where water is being supplied without treatment, the undertakers must satisfy themselves by making frequent analyses that this practice can safely be continued. Under modern conditions more frequent analyses are needed, particularly where there is a tendency to fluctuation in the composition or bacterial content of the water, and undertakers should be guided as to the actual frequency by their expert advisers. Regular inspections should be made of the gathering grounds and surrounding areas and all possible sources of contamination should be removed. Where there is cause to think that any sources cannot be kept free from the liability to pollution, the water should be effectively purified, and there is need for special safeguards where water is supplied from wells or borings into chalk or limestone. The utmost vigilance is also required to ensure that no risk of contamination arises from operations in connexion with the normal maintenance and improvement of waterworks, and where men are working on a well it is essential either to cut off the supply or to give precautionary treatment to the water. The water committee and its officers should work in close coöperation with the public health committee and the medical officer of health and local authorities should make it their duty to bring to the notice of water undertakers cases of enteric fever and other diseases likely to be waterborne and also any building development or other operations which might affect the purity of the supply.

Notification of Measles and Whooping-cough

At present notification of measles is compulsory in eleven metropolitan boroughs, but in only one of these does it apply to all cases. If the first case in each household had been notifiable throughout the county during the epidemic of 1935–36, it is estimated that about 94,000 cases would have been notified, and the total number of cases was actually far in excess of the 54,200 of which the borough medical officers of health were aware. Whooping-cough is notifiable in five boroughs, in one of which the reporting is limited to first cases in a household and in another to children under five years. It is of great importance that early information regarding the incidence of these diseases should be available if measures for their control are to be effective. Further, compulsory notification has an undoubted effect on the attitude of the general public towards an infectious disease, a notifiable disease being regarded more seriously, parents being more ready to obtain early medical advice, a matter of the greatest importance in measles and whooping-cough. On Tuesday evening the London County Council accepted the recommendation of its hospitals and medical services committee that both these diseases should be made compulsorily notifiable throughout London. It is intended, however, that notification should not apply to German measles or to a second or subsequent case of either disease occurring in the same house within two months.

Ambulance Services

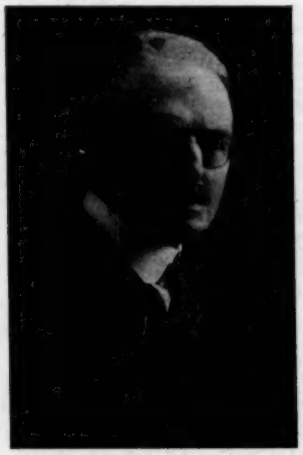
Suggestions have been put forward from time to time that all the ambulance work of the country should be brought under municipal or national control. At present the services in towns are mostly provided by the local authorities, whereas the rural

areas are covered by the fleet of nearly 400 ambulances controlled by the Home Service Ambulance Committee of the Order of St. John and the British Red Cross Society. In their report for 1937 this committee remark that any scheme which substituted for the voluntary workers of the first-aid organisations paid staffs under municipal control would be deplored. Even if the patients lost nothing by such a change the first-aid workers themselves would lose the opportunities which ambulance work provides for gaining practical experience in their craft and for maintaining their keenness and efficiency. What would, however, be welcome would be a fuller recognition by local authorities of their financial obligation to a service which carries an increasing burden of public work.

OBITUARY

SIR RAYMOND CRAWFURD, M.D. Oxon., F.R.C.P. Lond.

Raymond Henry Payne Crawfurd was born on Nov. 9th, 1865, the sixth son of the Rev. Charles Walter Payne Crawfurd, J.P., of East Grinstead. He was educated at Winchester, where he was a scholar and was in the school football team, and at New College, Oxford. He took his degree with honours in classics in 1888. He then entered King's College as a medical student and throughout his professional life was connected with King's College Hospital. He was elected assistant physician in 1898 and was physician from 1905 to 1930. For several years before his election to the full staff he was dean of the medical school and took special pride in the numerous successes of the students in the Murchison scholarship. His affection for the hospital was unbounded and he played a leading part in organising its removal from Clare Market to Denmark Hill, and when the new medical school was complete in 1933 his devotion was fittingly recognised by the award of a knighthood.



Crawfurd's nature was not attuned to the hurly-burly of private practice and he never cared for it, but he fully enjoyed the calmer lines of hospital work, the patients in the wards, the teaching and the contact with the medical students. In his earlier years he was on the staff of the Victoria Hospital for Children and of the Royal Free Hospital; at the latter he lectured on pathology and at King's he was lecturer on clinical medicine. He also examined in pharmacology for London University. At the Royal College of Physicians he delivered the FitzPatrick lectures in 1911–12 and was Harveian orator in 1919. His classical attainments and literary tastes led him naturally to the historical aspects of medicine. He helped to found the section of history of medicine at the Royal Society of Medicine, and he published several historical studies, notably "The King's Evil" and "Echoes of Pestilence in Literature and Art," the latter founded on his FitzPatrick lectures.

Much of his most useful work was done outside the strict application of medical practice. His quiet determination was invaluable where organisation was involved. In 1925, after having filled in succession the offices of councillor, censor, and senior censor, he became registrar of the College of Physicians and from that time took an important part in its deliberations. His personal characteristics led to him being trusted by all and beloved by those who knew him. Tall, calm, dignified, and slow in movement, he was scholarly in speech but practical in judgment. His courtesy never left him in debate; he listened attentively to arguments and was ready to change his mind, but when he considered that right demanded it he was tenacious of his opinions.

In 1915 he was invited to join the council of Epsom College, and in a short time his wide knowledge of educational matters led to his appointment as chairman of the school committee; he became chairman of the council in 1923 and resigned in 1936 on the eve of a long cruise. In those thirteen years he gained the complete confidence of the council and got to know all the masters and all the officials as well as many of the boys. As chairman he never put forward a proposal involving a change of policy without first ascertaining the views of many of the members, and if there was the slightest sign of dissent he would withdraw the proposal at once, to be resubmitted when he had won over the dissentients. To the last he seemed unaware of the benevolent despotism which his council had created for him. He found Epsom College a school of 300 boys, of whom 100 were in the preparatory department; he left it 500 strong, all of public school age. Crawfurd thought the school was too solidly medical; "the boys dissect their breakfasts!" he said. "The school has a definite obligation to its neighbours; we must accept day-boys exactly like boarders except that they sleep at home." And there are now 150 day-boys. He set about seeing that the school should maintain a science side second to none; biology, chemistry, and physics secured their separate buildings with laboratories and lecture theatre, and much costly equipment, a great deal of which he unobtrusively gave, begged, or borrowed. His most arduous task financially was to secure money for the erection of the sanatorium built in 1931 at a cost of £27,000, of which he must have obtained a third by his persuasiveness. His invariable reply to the question whether any expenditure was justified and, if so, possible, was: "I am informed, on reliable authority, that the money is either available or will be forthcoming." And somehow or other it always was. For the Royal Medical Foundation he was a Knutsford; he wrote thousands of letters himself, and he was responsible for the abolition of the voting system for election of pensioners and foundationers, because he knew that under that system the most deserving did not always get their share of consideration.

Crawfurd remained very human in his leisure pursuits. He was a regular fan of rugby football. A drive to and from Blackheath or Twickenham to see a match was a continuous joy to him.

Conversation might turn on the possibles for the next international, the merits of a probable hooker and scrum half, Epsom College, a recent work on medieval Europe, his last trip abroad, or anecdotes of Oxford and Winchester. A dramatic finish to the Navy and Army match on March 5th roused him to excitement and an attack of cardiac pain followed immediately. He knew his danger and viewed it unmoved, and he passed over calmly, a gentleman unafraid. He died at a nursing-home on March 9th at the age of 72.

Sir Raymond Crawfurd married Ethelberta Ormrod, daughter of Colonel Arthur Bailey, J.P., of Bolton, who survives him with three sons.

SIR ARTHUR DOWNES, M.D. Aberd., D.P.H.

Sir Arthur Henry Downes died suddenly on March 11th at his home on Mont Carmel, Palestine, at the age of 86. He was born in Shropshire in 1851, the son of Mr. T. R. C. Downes of Milford Lodge. From Shrewsbury school he went as a medical student to University College, London, where he was a gold medallist, and then to Aberdeen University where he took highest honours in the M.B. examination in 1873. He took his M.D. Aberd. in 1875 and a sanitary science certificate (the equivalent of the D.P.H.) at Cambridge in 1877. Between 1876 and 1886 he read a number of papers to the Royal Society on the action of light on bacteria, protoplasm, and chemical compounds, and he was the first to show that light inhibited the growth of bacteria. He was appointed M.O.H. for Chelmsford in 1879 and from 1889 to 1919 was Local Government Board inspector for the Metropolitan district. He served on the Royal Commission on the Poor Law and on various departmental committees, including those on the Midwives Act and the condition of the blind. He was chairman of the first Homeless Poor Committee for London and a vice-president of the Sunlight League from its foundation. He was knighted in 1910 and was a commander of the Order of the Crown of Belgium. His first wife, Evelyn, daughter of Mr. James Downes, died in 1892, leaving him with a son and a daughter. In 1902 he married Florence, daughter of Mr. Horace Chapman of Donhead House, Wilts, and sister of the Dowager Viscountess Allenby, and had one daughter.

Dr. HARRY ROSSER MANSELL, who died suddenly on March 10th in his seventy-eighth year, was a student of St. George's and served a period of apprenticeship in general practice before qualifying in 1887. He then settled in Hastings where for nearly fifty years his plate was a familiar sight on the corner house near the Castle. He must have been one of the first general practitioners to employ X rays in a case of fracture, and was rewarded for his enterprise by being sued, together with the radiologist, for an alleged X ray burn. During the war he was put in medical charge of troops stationed in the town. For some time he was president of the East Sussex Medico-Chirurgical Society. He was the typical family doctor, and like many such he will be mourned by some whose children as well as themselves he brought into the world. He leaves a widow and nine children.

PARLIAMENTARY INTELLIGENCE

HOSPITAL COLLECTIONS

IN the House of Lords on March 9th Lord STONEHAVEN moved the second reading of the Collecting Charities (Regulation) Bill. He said that a Departmental Committee set up by the Home Office in 1927 reported that witnesses had almost unanimously been of the opinion that the one method of collection which demanded control more than any other (except street collections) was door to door collections. Street collections had been dealt with very satisfactorily by the Police, Factories, etc. (Miscellaneous Provisions) Act, 1916. But that measure only applied to collections made on the thoroughfare itself. The present Bill was designed to prevent the scandals that had arisen owing to the operations of fraudulent enterprises. It proposed to prohibit house to house collections except where a police licence was granted or where the charity concerned was a national one which the Home Secretary might exempt from the provisions of the Bill. The Bill laid it down that a licence might only be withheld for one of four reasons—namely, that an excessive remuneration had been paid, or was likely to be paid, by the promoter to collectors; that proper accounts had not been kept, or that the affairs of the charity had been or were improperly administered; that a reasonably sufficient proportion of the proceeds did not reach the charity; or that the information furnished by the promoter was insufficient to enable the police authorities to form an opinion upon the propriety of its issue. Even if the police authority withheld a licence the promoter still had a right of appeal to a court of summary jurisdiction. He recognised that it was a delicate matter to interfere in any way with the collection of money for charitable purposes and although the Bill had been drawn so as to avoid injustice as far as could be seen, it might be appropriate to refer the Bill after second reading to a joint committee of both Houses of Parliament. In making that proposal he would mention two points. Lord Luke, acting on behalf of the British Hospitals Association, had suggested that the hospitals members of that association should be included as national charities and be exempted from the provisions of the Bill. There was a great deal to be said for that, and it was a point which might be considered by the joint committee. He had also received from Scotland expressions of regret that the measure did not apply to Scotland.

The Archbishop of CANTERBURY, in supporting the Bill, said that he constantly wondered both at the ingenuity of the bogus charity scheme promoter and the gullibility of the public. It was high time that something was done of a more drastic kind to protect the public.—Lord LUKE said that the Bill and its provisions had been carefully considered by King Edward's Hospital Fund and by the British Hospitals Association. Some hospitals had themselves suffered from the abuses against which the Bill was directed, and the hospitals were therefore disposed to approve the general principles of the Bill. At the same time, they feared that some of its detailed provisions might hamper their legitimate activities. The Bill already provided that national charities collecting over a substantial part of England and Wales might be exempted by the Home Secretary because of the large number of separate police licences which they would have otherwise to obtain. A simple voluntary hospital might not be a national charity in this sense, but the voluntary hospitals affiliated to the British Hospitals Association might well be placed on the same footing as national charities, since that association covered the whole country and was a responsible body which could vouch for its constituent hospitals. Any risks of abuse might be prevented if persons promoting a collection for an exempted charity were required to have a written authority from the charity.—The Earl of MINSTER, Lord-in-Waiting, said that a similar Bill was intro-

duced in the House of Commons in 1929. The Bill was subjected to a great deal of strong criticism and it did not make any further progress after second reading. In the light of that experience this matter required very careful consideration before any further legislation was passed. The Government were perfectly aware that at times abuses did take place which could not be dealt with under the existing law and they were therefore prepared to support the second reading of this Bill provided that it was sent either to a joint committee of both Houses or to a select committee of their Lordships' House. He would consult the Home Secretary on that matter and would inform Lord Stonehaven of the result.

NOTES ON CURRENT TOPICS

Foot-and-mouth Disease Research

In the House of Commons on March 9th Mr. RAMSBOTHAM, in introducing the vote for a supplementary estimate of £229,450 for the Ministry of Agriculture, said that it was occasioned by the recent outbreaks of foot-and-mouth disease. It was supposed that migratory birds were responsible for the infection coming into this country. It was known that the disease could be carried long distances, and though it was not yet certain that birds were susceptible, it was highly probable that they were mechanical carriers of the virus. Research in this disease was carried out by the Foot-and-Mouth Disease Research Committee, consisting of eminent scientists in the medical and veterinary professions under the chairmanship of Sir Joseph Arkwright. It was giving particular attention at the moment to the problem of immunisation, which was complicated by the fact that there were several types of virus in this disease.—Sir S. CRIPPS said that he noticed that there was a saving of £80,000 on the diseases of animals grants in respect of tuberculosis in cattle, which was set off as against the expenses on foot-and-mouth disease. Why had less money been spent on dealing with tuberculosis in cattle? The Labour Opposition were most anxious to see that the purification of the milk-supply of the country was proceeded with as rapidly as possible, and that there should be no relaxation in the effort to free our herds from tuberculosis.—Mr. W. S. MORRISON, Minister of Agriculture, said that he could assure Sir S. Cripps that the saving was due to no slackening of the efforts of the Ministry to ensure a pure milk-supply, but was indirectly due to increased momentum in that direction. In the Agricultural Act passed last summer he (Mr. Morrison) proposed to make an assault on tuberculosis in cattle by means of a central State Veterinary Service taking over the functions performed by veterinary officers employed by local authorities. At that time he anticipated that it would be possible for the new service to take over its duties by Jan. 1st, 1938, but the date of the transfer had had to be postponed to April 1st and this accounted for the saving of money. There had been a satisfactory response by the agricultural community to the new inducements offered by the Act for attested and disease-free herds. The Government would not cease their research for the purpose of finding an adequate foot-and-mouth disease serum.

Physique of Army Recruits

On March 10th in the House of Commons Mr. HORE-BELISHA, Secretary for War, said that applicants were now trying to join the British Army at the rate of nearly 60,000 a year, a total far in excess of the War Office requirements. The proportion of rejections was very high and it would seem to be a form of national service to enlarge the system whereby recruits below the normal physical standards could be engaged and brought up to a better state of health. There could be no more impressive way of showing the parents of such boys what the Army could do to strengthen them and enhearten them by special diet, education, and exercise. Out of every 100 boys who had passed through the Physical Development Depôt established by his (Mr. Hore-Belisha's) predecessor at Aldershot, 92 had passed into the Army as fully fitted soldiers. In view of the very satisfactory results the War Office proposed to open at least one more physical development depôt in 1938. One of the items of diet on which recruits in the Physical Development Depôt were sustained was, in accordance with prevailing medical doctrine, milk. In future, not only these recruits but all others who, in the opinion of the medical officer needed special nourishment, would have an extra issue of half a pint a day. The cost would be £8000 per annum. It was the intention of the Government to adapt all barrack accommodation to the latest standard, though this would necessarily take some time.

Sheffield Hospitals

The House of Lords have given a second reading to the Bill to unite the Royal Infirmary, Sheffield, and the Sheffield Royal Hospital in one corporation on the same lines as the Birmingham and Liverpool Acts with a similar object. The power to provide accommodation for paying patients is subject to the control of the Charity Commissioners although later it may be found desirable to vest any jurisdiction of this kind in the Ministry of Health. In the schedule regulating constitution and management there seems to be no provision for persons to qualify as life governors by the payment of one sum, as generally prevails in hospital procedure, although a governor for life may be appointed "in consideration of extraordinary services" rendered to the hospital. The District Association of Hospital Contributors is given eight representatives on the governing body as compared with the four allotted to the Merseyside Hospital Council in the Liverpool United Hospital Act. General practitioners are to be represented by nominees of the local medical and panel committee. As it stands however the Bill does not give any statutory recognition to a board or committee of the honorary medical staff; this is an omission which should be rectified.

Date of the Budget

Mr. CHAMBERLAIN announced in the House of Commons on March 10th that the Chancellor of the Exchequer would open his Budget on Tuesday, April 26th.

QUESTION TIME

WEDNESDAY, MARCH 9TH

Accommodation at Roehampton Hospital

Mr. TOM SMITH asked the Minister of Pensions the number of beds available at the Roehampton Hospital for the treatment of ex-Service men; the number of cases treated during 1937; and the average length of time each patient was in hospital.—Mr. H. RAMSBOTHAM replied: The number of equipped beds available for officers and men is 414. 2195 cases were treated during the year 1937 and the average length of stay of those discharged was 79 days.

Non-Manual Workers and Health Insurance

Mr. NAYLOR asked the Minister of Health if it was within his knowledge, and with his approval, that national health insurance inspectors were ruling that partly employed non-manual workers in receipt of less than £250 per annum could not be recognised for national insurance purposes on the ground that, if they were fully employed, their wages would amount to more than £250 per annum.—Sir KINGSLEY WOOD replied: Rulings given by National Health Insurance inspectors in the type of case referred to by the hon. Member are governed by the provisions of the National Health Insurance Act. The question whether a non-manual worker is insurable depends on the yearly rate of his remuneration, and the Act provides that where the employment involves only part-time service the rate of remuneration is to be taken as the yearly amount that would be payable for whole-time service.

Industrial Employees and Hospital Contributions

Mr. ROBERT GIBSON on March 9th asked the First Lord of the Admiralty if he was now in a position to make a statement regarding arrangements for collecting the contributions of the non-established workers in the Royal Naval Torpedo Factory, Greenock, to their hospital's fund from their pay.—Mr. GEOFFREY SHAKESPEARE, Parliamentary Secretary to the Admiralty, replied: The hon. Member will be pleased to learn that arrangements are now being made to institute the centralised machinery, referred to in the reply given to him on this subject on Dec. 15th last, under which Government industrial employees in any part of the country, not covered by existing contributory schemes, may arrange for contributions to local hospital funds by means of deductions from their pay.

THURSDAY, MARCH 10TH

Mothers Convicted of Infanticide

Mr. CREECH JONES asked the Home Secretary in how many cases during the 10 years ended on Dec. 31st, 1936, mothers had been convicted of the wilful murder of their children under eight years of age and had been sentenced to death and subsequently reprieved; and if he would give the age of each of the child victims concerned.—Sir SAMUEL HOARE replied: The following mothers were sentenced to death for the murder of their children under eight years, and subsequently reprieved in the period from Jan. 1st, 1927, to Dec. 31st, 1936:—

Year.	Age of child victim.	Year.	Age of child victim.
1927 (Case 1) ..	6 months.	1933 (Case 2) ..	20 months.
„ (Case 2) ..	1 month.	1934	1 month.
„ (Case 3) ..	2 years.	1936 (Case 1) ..	17 months.
1930	2 months.	„ (Case 2) ..	5 „ (twins).
1931	9 „	„ (Case 3) ..	12 months.
1932	3 „	„ (Case 4) ..	4 „
1933 (Case 1) ..	18 „		

Free Meals for School-children

Mr. SANDYS asked the Parliamentary Secretary to the Board of Education how many local education authorities still made no provision for the supply of free solid meals to children.—Mr. KENNETH LINDSAY replied: One hundred and seventy-two local education authorities make no provision for the supply of free solid meals.—Mr. SANDYS: What is being done to encourage them to make this provision?—Mr. LINDSAY: I think that those figures need careful examination. For example, there are only three county boroughs where the authorities supply neither free milk, nor free solid meals. In regard to the counties there are obvious difficulties to be overcome, which are being negotiated by the extension of senior schools with canteens. In addition the Board is encouraging local education authorities to conduct nutrition surveys, with good results.—Mr. LEACH: Are these places which refuse to operate the Act mostly cathedral cities?—Mr. LINDSAY: On the whole they are residential watering places and market towns.

Viscountess ASTOR: Would the Parliamentary Secretary remind these education authorities of the words of the chief medical officer of the Board who says that one cannot expect an undernourished child to derive benefit from physical exercises?

Miss RATHBONE: Is the Parliamentary Secretary aware that there are under 2 per cent. of the child population of the schools in receipt of school meals on any one day?

Mr. LINDSAY: We might be told that that is a good sign.

Approved Societies and Benefits

Mr. JAMES GRIFFITHS asked the Minister of Health if he was aware of the growing concern felt by a large number of the smaller approved societies operating under the National Health Insurance Acts at the loss of membership to the larger and richer societies, who were able to offer inducements to insured persons to transfer because of the wider range of additional benefits offered; and if he would now inquire into the possibilities of coördinating the health insurance services so as to ensure that all those who made equal contributions should secure equal benefits under the State insurance scheme.—Sir KINGSLEY WOOD replied: I cannot agree that the smaller approved societies are ordinarily at any disadvantage as compared with the larger societies as regards the additional benefits which they are able to provide for their members. Insured persons have freedom of choice of society and it is only to be expected that some will seek to transfer from societies with relatively unfavourable valuation results to others in a more favourable position. There is, however, already statutory provision for the protection of the weaker societies against undue loss of membership by transfer and the position is not, in my opinion, such as to call for the course suggested by the hon. Member, which would involve, amongst other consequences, the abolition of the approved society system.

Mr. GRIFFITHS: Does not the right hon. gentleman think that it is desirable and even necessary that those who contribute equally to a scheme of this kind should get equal benefits, quite apart from the effect of this disparity of additional benefits on the smaller societies and upon those who remain loyal to the smaller societies; and does he not think that the time is opportune to make a complete inquiry into the possibility of establishing a coördinated scheme which will give equal benefits to everybody?

Sir KINGSLEY WOOD: No, Sir. Because a society is small it need not necessarily have a bad experience. Often the difference, as far as the small societies and the large societies are concerned, is very small.

Standard Tests for Water-supplies

Mr. CHORLTON asked the Minister of Health whether he was yet able to give an indication of what he proposed to do with regard to standardising the tests necessary for public water-supply, whether it be by company or local authority.—Sir KINGSLEY WOOD replied: I hope shortly to issue a circular to local authorities on the question of the safeguarding of water-supplies.

Typhoid Fever in Somerset

Sir FRANCIS FREMANTLE asked the Minister of Health how many deaths had occurred in the outbreak of typhoid fever in the county of Somerset; and to what cause the outbreak had been traced.—Sir KINGSLEY WOOD replied: I regret to say that there were seven deaths. The evidence is that the outbreak was due to the consumption of foodstuffs which had been infected by an individual who was suffering from a condition which had not been diagnosed.

Dr. HADEN GUEST: Was the foodstuff milk? Sir KINGSLEY WOOD: No; I do not think so.

Diabetic Candidates for the Civil Service

Mr. MCENTEE asked the Secretary to the Treasury whether, in view of the successful results achieved by the use of insulin in the treatment of diabetics, he would now amend the regulations debarring those suffering from diabetes from entry into the public services.—Colonel COLVILLE replied: There is no actual regulation debarring those suffering from diabetes from entry to the Civil Service; the existence of this disease is, however, a factor which has to be considered in the medical examination which is undergone by candidates for entry to, or establishment in, the public service. Each case is decided on its merits by the appropriate authority, in the light of the medical report. Since it has to be considered not only whether the candidate is at present fit for the duties of the post he seeks, but also whether he will remain so till the age of retirement, this decision must often be adverse in spite of the efficacious treatment available to-day.

MONDAY, MARCH 14TH

Imports of Cod-liver Oil

Mr. ROBERT GIBSON asked the President of the Board of Trade what were the imports of cod-liver oil from Norway for the years 1929 and 1937; and if he had any statement to make thereon.

Captain WALLACE, Parliamentary Secretary to the Board of Trade, replied: Total imports into the United Kingdom

of cod-liver oil consigned from Norway amounted to 1894 tons during 1929 and to 383 tons during 1937. Since the duty of *1s. 4d.* per gallon was imposed on foreign cod-liver oil under the Ottawa Agreements Act, 1932, imports from Newfoundland have increased and there has been a substantial development of United Kingdom production.

Treatment at Roehampton Hospital

Mr. SORENSEN asked the Minister of Pensions how many pensioners were still receiving medical or hospital treatment at Roehampton and elsewhere; whether he was aware that many of such patients lost their employment in consequence of constant or prolonged interruptions of employment due to this necessary treatment; whether he would see that the charge of *19s.* for treatment at Roehampton was reduced; and whether he would only charge patients up to the day of discharge and not for any period subsequent thereto.—Mr. H. RAMSBOTHAM replied: The number of in-patients in Roehampton and other hospitals (apart from mental hospitals) is 2128. Arrangements have been made, in conjunction with the Minister of Labour, by which patients in all Ministry hospitals who are unable to return to their former employment may, a week before their discharge, notify the employment exchange of their district and so receive prior consideration for fresh employment. The allowances which are payable in addition to free treatment are, under the terms of the Royal warrant, at fixed weekly rates and are paid weekly in advance. Adjustments between allowances and pension on a daily basis would not be administratively practicable.

TUESDAY, MARCH 15TH

Sick Accommodation in Troopships

Mr. DE LA BÈRE asked the Secretary of State for War, in connexion with the improved accommodation on transports for trooping, what steps were being taken to provide improved accommodation for the sick.—Mr. HORE-BELISHA replied: The hospital accommodation in a transport provides both for invalids from stations abroad, and for cases of sickness arising on the voyage. In the newer transports—namely, the *Dilwara* and *Dunera* and the two under construction—the cubic space for each individual has been increased. Improved types of bed and cot and better ventilation and lighting arrangements have been installed. The dispensaries are larger, and facilities for microscopic work have been provided. Several other kinds of improvement have also been adopted, such as refrigerators instead of ice-chests, proper cot-lifting units, and so on. The women's wards are similarly improved, and a separate medical inspection room for women has been provided. In the older transports higher standards of comfort and equipment have been provided as far as the accommodation will allow.

Grants for Veterinary Research in Scotland

Mr. ANSTRUTHER-GRAY asked the Home Secretary by what amount and in what way Scotland had benefited from the distribution of profits by the Racecourse Betting Control Board.—Mr. GEOFFREY LLOYD, in reply, said that grants had been made by the Racecourse Betting Control Board for the following, among other, objects specifically connected with Scotland: £1000 to investigations into grass sickness at the Institute of the Animal Diseases Research Association at Moredun, near Edinburgh. A further grant of £750 had been approved. £625 to research into disabling diseases of horses at the Royal (Dick) Veterinary College, Edinburgh. A further grant of £650 had been approved. £500 to the building fund of the Royal (Dick) Veterinary College, Edinburgh. A further grant of £500 had been approved. It was proposed to make a grant of £500 to the Glasgow Veterinary College.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 5TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 2 (Port of London, Leighton Buzzard); scarlet fever, 2367; diphtheria, 1556; enteric fever, 16 (29 "expected"); pneumonia (primary or influenzal), 1294; puerperal pyrexia, 193; cerebro-spinal fever, 50; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 3; dysentery, 155; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 11th was 5386, which included: Scarlet fever, 840; diphtheria, 1275 (carriers 42); measles, 1892; whooping-cough, 271; puerperal fever, 15 mothers (plus 10 babies); encephalitis lethargica, 284; poliomyelitis, 1. At St. Margaret's Hospital there were 32 babies (plus 14 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox or enteric fever, 44 (14) from measles, 8 (0) from scarlet fever, 26 (2) from whooping-cough, 50 (8) from diphtheria, 56 (19) from diarrhœa and enteritis under two years, and 57 (6) from influenza. The figures in parentheses are those for London itself.

Birkenhead reported 4 fatal cases of measles, Liverpool 3. Liverpool also had 8 deaths from whooping-cough, no other great town more than 1. Diphtheria was fatal in 27 great towns, Liverpool reporting 9 deaths, Birmingham 3.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 38 per 1000 total births), including 28 in London.

THE LANCET 100 YEARS AGO

March 17th, 1838, p. 908.

From a leading article on the confusion created by the host of licensing medical institutions.

The sick are not left to determine, by their own judgments whether an individual is qualified or not to treat their diseases. Chartered companies pretend to solve this question for the sick, and even to express different degrees of qualification. As gold, silver, and copper coin is stamped at her MAJESTY'S Mint, for the public convenience, so are there examined, stamped, and authorised physicians, surgeons, and apothecaries. But the physicians, surgeons, and apothecaries are examined at 19 different places; the examiners are irresponsible; they have 19 entirely different tests and standards; and things of different value are stamped with the same title; and that which is called apothecary here, is called physician or surgeon there; those that pass current in one district are called counterfeits in another. . . .

If no examining bodies existed, and no titles were bestowed, errors would be committed; but they would neither be so fatal, nor so flagrant, as the errors into which the public are systematically led by 19 Examining Boards. This is exemplified by a fable, for which the reader may, if he please, refer to LA FONTAINE. One fine day in summer, a Norman bonne was walking with a boy, ten years old, in the *Jardin des Plantes*. She had just observed that the names of all the animals were written on labels, when they arrived at an enclosure on which the boy read "Zebra." "Ah!" he exclaimed, "that is not like the streaked zebra in my spelling-book; it is of a dusky brown, and the very image of an ass." He was right; it was a foreign species of the ass, but an ass in every particular. The label had been misplaced. His guide, however, bade him look at the dark streak across the shoulders, and insisted that the ass was a zebra. The animal brayed, and the boy recognised an ass in the bray; but the preceptress persisting in her infallibility, went on to say:—"Child, believe me, this is a zebra—read the name—it is written and placed here by learned men appointed expressly for the purpose by the King." Several other errors arose in a similar manner, for on that day the labels had been accidentally as much misplaced as if nineteen Examining Boards had been employed to manage them; but we can only add, that much ingenious argument was used, to show that the same animal, called by three names by naturalists, was three essentially different animals. The moral need not be added, it is our argument.

MEDICAL NEWS

University of Oxford

Rolleston memorial prize.—This prize, which is of the value of about £100, is awarded every two years for original research in animal and vegetable morphology, physiology and pathology, or anthropology. Memoirs already published may be submitted and graduates or research students of the Universities of Oxford and Cambridge are eligible. Further information may be had from the registrar of the university to whom essays should be sent before March 31st.

Radcliffe prize.—The next award of this prize, which is of the value of £50, will be made in March, 1939. It is awarded for research in any branch of medical science and is open to all graduates of the University who are proceeding to a medical degree in the University. Further information may be had from the Secretary of Faculties, University Registry, Oxford.

Dr. W. E. Henley, second assistant to the medical unit of St. Mary's Hospital, has been elected to a fellowship on the foundation of Dr. John Radcliffe.

University of Cambridge

On March 11th the following degrees were conferred :—

M.D.—Stuart McDonald, K. M. A. Perry, Joseph Smart, and V. H. Riddell.

M.Chir.—W. F. Nicholson.

M.B., B.Chir.—*A. L. Cochrane, *G. R. Rawlings, *J. K. Moore, R. L. Townsend, and David Rubin.

* By proxy.

Royal College of Surgeons of England

A meeting of the council of the college was held on March 10th, with Sir Cuthbert Wallace, the president, in the chair. Mr. C. P. G. Wakeley was re-elected a member of the court of examiners, and it was reported that Mr. P. B. Ascroft had been reappointed a Streatfeild research scholar for a second year.

It was decided that the University of Hyderabad should be recognised as a school at which the study for the primary examination for the fellowship might be taken.

Diplomas of fellowship to the following candidates :—

R. C. Percival, L.R.C.P. Lond. ; G. L. Bohn, M.B. Lond. ; H. R. Pasricha, M.B. Punjab ; I. E. Zieve, L.R.C.P. Lond. ; J. A. Dhacka, M.B. Bombay ; D. M. Jones, M.B. Lond. ; J. H. Mayer, M.B. Lond. ; R. G. Talwalkar, M.B. Bombay ; Eric Vernon, M.D. Manch. ; Margaret M. Ferguson, M.B. Manch. ; R. H. Karmarkar, M.B. Bombay ; M. N. Khanna, M.B. Punjab ; T. D. V. Krishnan, M.B. Madras ; R. S. Lawson, M.B. Melb. ; J. F. Shepherd, M.B. Aberd. ; Marcel Sofer Schreiber, M.B. Sydney ; and S. P. Srivastava, M.B. Lucknow.

A diploma of membership was granted to Robert Cox of Westminster Hospital, and licences in dental surgery were granted to the following candidates :—

Sydney Ackers, Ernest Allen, J. A. Avasia, Dorothy M. Bateman, R. A. C. Battson, Paul Borghys, T. P. Bromley, C. F. H. Bulow, P. A. Chandler, C. A. Chaundy, G. F. Daws, F. D. Ford, J. H. French, P. H. F. Gaskell, G. H. Gibbs, Samuel Goldman, Minnie E. Gregg, J. B. Hardie, R. W. Harvey, J. R. Holmes, Ruth W. Jenkins, J. R. Kempe-Roberts, P. D. Law, D. F. Mace, N. H. McLellan, A. H. Millett, P. B. Myers, R. D. Ogston, A. E. Parrott, J. W. R. Payne, R. C. Price, A. S. Rowe, C. A. Sabine, W. W. Saleeby, D. G. Sharp, Murray Shaw, A. J. Sheldon, W. B. B. Southwell, J. J. Spencer, George Sperryn-Jones, P. D'E. Spooner, G. C. Sprigings, Cyril Squire, D. D. Stalford, E. D. Stanhope, G. P. L. Taylor, R. H. Thoseby, J. H. D. Tobin, F. G. Triay, J. W. Truscott, B. F. Vellender, G. W. Vincent, N. C. Ward, Howard Williams, R. B. Wise, and Tony Wolf.

Diplomas in ophthalmic medicine and surgery were granted jointly with the Royal College of Physicians to the following candidates :—

G. H. Appel, A. H. Booth, D. K. Bose, G. H. Buck, E. W. B. Griffiths, S. P. Gupta, A. G. Hiremath, Jacob Joels, J. B. d.S. Karki, H. O. Little, John Macaskill, N. C. Mandalia, J. D. Martin-Jones, T. R. Pahwa, J. B. Patrick, Henry Penman, C. V. D. Rose, E. N. Rosen, Richard Stuart, R. A. Syed, and Simon Wigoder.

Society of Radiographers

This society is holding a mock trial at the Cowdray Hall, 1A, Henrietta-street, London, W., on Saturday, March 19th, at 7 P.M., when the action of Martin *v.* The Northside Hospital and Violet Wray will be tried. Further information may be had from the secretary of the society, 32, Welbeck-street, London, W.1.

Dr. Burgess Barnet, who was curator of reptiles at the London Zoo from 1932 till last June, has been appointed superintendent of the zoological gardens at Rangoon.

International Hospital Association

Mr. W. McAdam Eccles has been appointed chairman of the United Kingdom Council of this association in succession to Mr. H. L. Eason, who resigned last year.

Royal Sanitary Institute

A meeting of the Institute will be held at Yeovil on Friday, April 8th, at 5 P.M., when Sir William Savage will open a discussion on milk and pasteurisation. Further information may be had from the secretary of the Institute, 90, Buckingham Palace-road, London, S.W.1.

Harveian Society of London

The subject for the Buckston Browne prize essay for 1939 is the value of periodic medical examination in the detection of disease in middle life. The prize, which consists of a medal and £100, is open to any member of the medical profession registered in the British Isles or Dominions who is under 45 years of age. Essays must be sent to Mr. C. P. G. Wakeley, 14, Devonshire-place, London, W.1, before Oct. 1st, 1939.

Maternity and Child Welfare Conference

A national conference on maternity and child welfare will be held at the University of Bristol on July 5th, 6th, and 7th, under the presidency of Mr. R. H. Bernays, M.P. The main subject for discussion will be the child of the future. The conference is being organised on behalf of the National Council for Maternity and Child Welfare by the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality. Further information may be hade from the hon. secretary, Carnegie House, 117, Piccadilly, London, W.1.

Union Thérapeutique

The annual meeting of this body will be held in Paris on Oct. 12th under the presidency of Prof. Loeper. Papers will be read by Prof. Dautrebande (Liége) on oxygen-therapy, by Prof. Singer (Vienna) on protein therapy in diabetes, by Prof. Hernando (Madrid) on the use of vitamins in the treatment of diseases of the digestive organs, by Prof. Buergi (Berne) on chlorophyl and cutaneous lesions, and by Prof. Henri Benard and Dr. Sallet (Paris) on continuous intravenous injections. A joint session with the Société de Thérapeutique de Paris will also be held when the principal subject for discussion will be the therapeutic use of sulphur. The speakers will include Prof. Buergi, Prof. Knud Schroeder (Copenhagen), Prof. Léon Binet (Paris), Prof. Campanacci (Parma), and Dr. Louis Bory (Paris). Further information may be had from the secretary-general, 24, rue de Téhéran, Paris VIII.

Appointments

ALDRIDGE, A. G. V., M.B. Camb., Resident Medical Officer at the Children's Hospital, Birmingham.

BARBER, H. STUART, M.B. Dubl., M.R.C.P., Medical Registrar at the Prince of Wales's General Hospital, London.

BRAITHWAITE, J. V., M.D., M.R.C.P. Lond., Consultant Physician to the Kettering and District General Hospital.

*CLARK, W. G., M.B. Glasg., D.P.H., Medical Officer of Health for Edinburgh.

DRURY, JOAN C., M.B. Camb., Assistant Pathologist at the Swansea General and Eye Hospital.

FORGAN, EVELYN J., M.B. Lond., Temporary Medical Registrar at the Elizabeth Garrett Anderson Hospital.

HARDY, ROBERT, M.B. Edin., D.P.H., Assistant School Medical Officer for Newcastle-upon-Tyne.

LASK, SAMUEL, M.B. Leeds, Assistant Medical Officer at Preston Hall Sanatorium, near Maidstone.

MILLER, ARTHUR, F.R.C.S. Edin., D.L.O., Consulting Otologist to the Ealing School Medical Service.

PARSONS, CLIFFORD, M.B. Camb., M.R.C.P. Lond., Receiving-room Officer at the Children's Hospital, Birmingham.

STOTT, ARNOLD, B.Chir. Camb., F.R.C.P. Lond., Physician to the Westminster Hospital.

* From October next.

Vacancies

For further information refer to the advertisement columns

Accrington Borough.—Deputy M.O.H. and School M.O., £500.
Ashton-under-Lyne, Lake Hosp. and Darnton House Institution.—Sen. and Jun. Res. M.O.'s, £250 and £225 respectively.
Barking Borough.—Asst. M.O., £600.
Battersea General Hosp., Battersea Park, S.W.—Hon. Radiologist.
Bechuanaland, Scottish Livingstone Hosp., Molepolole.—Doctor-Missionary.
Bedford County Hosp.—H.S., at rate of £155.
Birmingham Maternity Hosp.—H.S., at rate of £75.
Birmingham Royal Cripples Hosp.—Res. H.S., at rate of £200.
Birmingham, Selly Oak Hosp.—Res. Physician, £650.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Bradford Royal Infirmary.—Five H.S.'s, each at rate of £150.
Brighton, Royal Sussex County Hosp.—Cas. H.S., £120.
Bristol, Barrow Hosp.—Second Asst. M.O., £400.
Bristol City and County.—Asst. M.O.H., £500.
Bristol Dispensary.—Medical Officer.
British Postgraduate Medical School, Ducane-road, W.—First Asst. in Dept. of Surgery, £250–£500.
Cambridge, Addenbrooke's Hosp.—H.P., H.S. to Spec. Dept., and Res. Anæsthetist and Emergency Officer, each at rate of £130.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Reg. and Clin. Tutor, £300.
Charing Cross Hosp., W.C.—Cancer and Radium Registrar, £100.
Chester Royal Infirmary.—Two H.S.'s, each £150.
Derbyshire County Council.—Asst. Maternity and Child Welfare M.O., £600.
Derbyshire Royal Infirmary.—H.S. for Ear, Throat, and Nose Dept., £150.
Doncaster Royal Infirmary and Dispensary.—Hon. Orthopædic Surgeon, £250.
Dorset County Council.—County Pathologist, £750.
Dundee Mental Hosp., Westgreen.—Jun. Asst. M.O., £300.
Durham County Council.—Temp. Asst. M.O.H., £600. Also Asst. Welfare M.O., £500.
Durham County Mental Hosp.—Locum Tenens Asst. M.O., 1 guinea per day.
Eastbourne, Princess Alice Hosp.—Res. H.S., £150.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Clin. Asst. to Ophthalmic Dept. Out-patients, £50.
Essex Administrative County.—Asst. Specialist Ophth. Surgeon, £700.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.S., at rate of £120.
Glasgow Eye Infirmary.—Res. H.S., £150.
Grimsby Corporation Hosp. and Sanatorium.—Res. M.O., £350.
Halifax Royal Infirmary.—Res. Surg. O., £250. Also H.S.'s, at rate of £200, £175, and £150 respectively.
Haywards Heath, Brighton County Borough Mental Hosp.—Third Asst. M.O., £350.
Herefordshire General Hosp.—H.S. to Spec. Depts., £100.
Hertfordshire County Council.—M.O. for Maternity and Child Welfare Work, £500.
Hosp. for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P., at rate of £150 and £100 respectively.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. and Out-patient Aural Registrar, £200 and £175 respectively. Also two H.P.'s and two H.S.'s, each at rate of £50.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S., at rate of £75.
Hove General Hosp.—Jun. Res. M.O., at rate of £120.
Huddersfield County Borough.—Asst. M.O.H., £500.
Hull Royal Infirmary.—Second H.P., at rate of £150.
Ilford, King George Hosp.—H.S., at rate of £100.
Inverness, Royal Northern Infirmary.—Med. Supt., £500.
Ipswich, East Suffolk and Ipswich Hosp.—Cas. O., £144.
King Edward Memorial Hosp., Ealing.—H.S., at rate of £150.
Leicester City Mental Hosp.—Asst. M.O., £350.
Lincoln City Hosp. and Sanatorium.—Res. M.O., £300.
London Chest Hosp., Victoria Park, E.—H.P., at rate of £100.
London County Council.—Radiologists, each £900. Obstetrician and Gynæcologist, £800. Second Asst. M.O., £625. Two Asst. M.O.'s, each £600. Sen. Asst. M.O. (Grade II), £500. Asst. M.O.'s (Grades I and II), £350 and £250 respectively. Part-time M.O.'s, each £300. Also Anæsthetists, each £125.
London Hosp., E.—Anæsthetist to Dept. of Neurosurgery, £250. Also Clin. Asst. in X Ray Dept., £100.
London University.—Sir Henry Royce Research Fellowship, £500.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Ancoats Hosp.—Res. Surg. O., £200.
Manchester Royal Infirmary.—M.O. to Out-patients, £105.
Manchester and Salford Hosp. for Skin Diseases.—H.S., at rate of £150.
Medical Research Council, 38, Old Queen-street, S.W.—Kathleen Schlesinger Research Fellowship, £300.
Middlesex County Council.—Tuberculosis M.O., £750.
Mount Vernon Hosp., Northwood.—H.S., £150.
National Temperance Hosp., Hampstead-road, N.W.—Cas. O., at rate of £120.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. Gynæcologist and Obstet. Registrar, and Asst. to Radiological Dept., each £300. Also Registrar to Orthopædic Dept., £150.
Nottingham General Hosp.—H.P., at rate of £150.
Oxford University.—First Asst. in Dept. of Clin. Medicine, £600.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—H.S., at rate of £100.
Oxted and Limpsfield Cottage Hosp.—Hon. Ear, Nose, and Throat Surgeon.
Paddington Green Children's Hosp., W.—H.P. and H.S., each at rate of £150.
Plymouth, Prince of Wales's Hosp.—Asst. Pathologist, £500. Also Jun. H.S., at rate of £120.
Portsmouth and Southern Counties Eye and Ear Hosp.—H.S., £150.
Preston, Biddulph Grange Orthopædic Hosp.—Asst. Visiting Orthopædic Surgeon, £250.
Preston, Sharoe Green Hosp.—Jun. Asst. Res. M.O., at rate of £100.
Princess Beatrice Hosp., Earl's Court, S.W.—Hon. Clin. Assts. to Out-patients' Dept.
Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Sixth M.O. for Antenatal Dept.
Richmond Royal Hosp., Surrey.—Sen. and Jun. H.S.'s, £150 and £100 respectively.
Rotherham Hosp.—H.P., £180.
Royal Free Hosp., Gray's Inn-road, W.C.—Res. Cas. O., £150.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—Medical Officers.
St. Bartholomew's Hosp., E.C.—Part-time Chief Asst. in X Ray Diagnostic Dept.
St. George's Hosp., S.W.—Physician. Also Asst. Physician.
St. Mary's Hosp., W.—Med. Reg., £200.
Salisbury General Infirmary.—H.S., at rate of £125.
Salop County Council.—Asst. M.O., £500.
Sheffield Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept., at rate of £80.
South Eastern Hosp. for Children, Sydenham, S.E.—Res. M.O., at rate of £100.
South London Hosp. for Women, Clapham Common, S.W.—H.P., at rate of £100.
Southend-on-Sea General Hosp.—H.P. and H.S., each at rate of £100.
Stockport, Stepping Hill Hosp.—Res. Asst. M.O., £350.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, £150.
Surrey County Council.—Asst. M.O., £600.
Swanley, Kent, Alexandra Hosp. for Children with Hip Disease.—Second Res. M.O., at rate of £250–£300.
Tavistock Clinic, Malet-place, W.C.—Diagnostic Physician, £50.
Tunbridge Wells, Kent and Sussex Hosp.—Sen. H.S., £150.
Walsall General Hosp.—Asst. Hon. Surgeon to Ear, Nose, and Throat Dept.
Westminster Hosp., S.W.—Asst. Physician.
Wimbledon Hosp., Copse Hill, S.W.—Res. M.O., at rate of £150.
Windsor, King Edward VII Hosp.—H.S. and Cas. O., each £120.
Wolverhampton, New Cross Hosp.—Res. Asst. M.O., £200.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E. Res. M.O., £150. Also H.S., at rate of £100.
Worcester County and City Mental Hosp.—Asst. M.O., £350.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Denton (Lancaster), Anstey (Leicester), Andover (Southampton, Hants), and Yaxley (Huntingdon).

Medical Referee under the Workmen's Compensation Act, 1925, for the Stafford, Lichfield, Tamworth, and Uttoxeter County Court District (Circuit No. 26). Applications should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W.1, before April 5th.

Medical Diary

March 21st to March 26th

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

WEDNESDAY.

Comparative Medicine. 5 P.M., Dr. G. M. Findlay and Dr. F. O. MacCallum: Hepatitis and Jaundice in Association with Immunisation against Certain Virus Diseases. Dr. H. P. Bayon: Diagnostic Avian Pathology in Relation to Poultry Diseases.

THURSDAY.

Urology. 8.30 P.M., Mr. Stanford Howard: (1) Carcinoma of Kidney. Mr. H. P. Winsbury-White: (2) Radiograms of Stricture of Ureter. Mr. R. H. Jocelyn Swan: (3) Coincident Hypernephromata of Kidney, Adrenal, and both Ovaries. (4) Metastasis in the Rectus Abdominis Muscle from Papillary Carcinoma of the Bladder. Mr. Kenneth Watkins: (5) Primary Papilloma of the Ureter. (6) Carcinoma of the Renal Pelvis and Ureter. (7) Carcinoma of Both Ureters, Secondary to Carcinoma of Bladder. (8) Carcinoma of Bladder with Obstruction at the Vesical Orifice and Extension up One Ureter. Mr. R. H. O. B. Robinson: (9) Teratoma of the Bladder. Mr. A. E. Roche: (10) Total Cystectomy.

FRIDAY.

Disease in Children. 5 P.M. (Cases at 4 P.M.), Mr. E. A. Freeman and Dr. J. H. Sheldon: (1–2) Craniocarpotarsal Dystrophy of ? Undescribed Type. Dr. Sheldon: (3) Calcinosis. Mr. R. Milnes Walker: (4–5) Pneumonectomy for Bronchiectasis. Dr. C. E. Field (introduced by Dr. Reginald Lightwood): (6) Cerebral Sequelæ after Neonatal Jaundice Ascribed to Kernicterus. Dr. A. Moncrieff and Dr. E. Davis: (7) Microcytic Anæmia Resistant to Treatment. Dr. T. Colver (for Dr. Wilfrid Sheldon): (8) Case for Diagnosis. Dr. G. H. Newns: (9) Boeck's Sarcoid in a

Boy of 2 years. Dr. Newns: (*a*) Congenital Mitral Stenosis. (*b*) Acute Bacterial Endocarditis in an Infant.
Epidemiology and State Medicine. 8.15 P.M., Dr. R. W. Dodgson: Shell-fish and the Public Health (with film).

MONDAY.
Odontology. 8 P.M., Mr. S. A. Riddett: (1) Tumour of the Palate. Mr. Percival Cole: (2–4) Pedicle Bone Graft for Fractured Mandible. Mr. J. G. Turner: (5) Spread of Caries. (6) Enamel Hypoplasia. Mr. Frank Coleman: (7) Fracture of Mandible. (8) Cyst of the Mandible. (9) Extra Molar Tooth. Mr. H. O. Dickin: (10) Dental Models Illustrating Development under Treatment by Means of Oral Screens. Mr. F. N. Doubleday: (11) Widening of the Aperture of the Mouth. (12) Hypertrophic Gingivitis treated without Operation. Mr. A. L. Packham: (13) Unilateral Fibrous Ankylosis of Right Temporomandibular Joint in a Child of 8 years. Mr. W. Warwick James: (14) An Old Fracture of the Mandible. (15) Necrosis of the Mandible.

FRIDAY.
Anæsthetics. 8.30 P.M., Dr. C. L. G. Pratt: Some Physiological Points of Importance in Anæsthesia.

MEDICO-LEGAL SOCIETY.
THURSDAY.—8.30 P.M. (26, Portland-place, W.), Dr. S. W. Fisher: Medico-Legal Aspects of Coal Mining.

HUNTERIAN SOCIETY.
MONDAY.—8.30 P.M. (Simpson's Restaurant, 2, Bird-in-hand Court, 76, Cheapside), Mr. Norman Lake and Mr. John Hanby: Painful Feet.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.
FRIDAY.—8.30 P.M. (11, Chandos-street, W.), Mr. Aleck Bourne: Chronic Cervicitis.

ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS.
FRIDAY.—5 P.M. (London School of Hygiene, Keppel-street, W.C.), business meeting. 6 P.M., Dr. J. C. Bridge: First-aid in Factories. Mr. P. H. Mitchiner: Minor Surgery Applied to Industrial Medical Services.
SATURDAY.—10 A.M. (St. Thomas's Hospital, S.E.), Mr. P. H. Mitchiner: Practical Demonstration of Minor Surgery and Casualty Surgical Methods.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Thornhaugh-street, W.C.
Fever Hospital Medical Service Group.
FRIDAY.—4 P.M., Dr. V. D. Allison and Dr. Robert Cruickshank: The Streptococcal Infections as Ascertained by Type Determinations.

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY.—8.30 P.M. (1, Wimpole-street, W.), Dr. Margaret Lowenfeld: The World Pictures of Children.

EUGENICS SOCIETY.
TUESDAY.—5.15 P.M. (rooms of the Royal Society, Burlington House, Piccadilly, W.), Miss Evelyn Fox: Modern Development in Mental Welfare Work.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY and THURSDAY.— 5 P.M., Dr. J. G. Greenfield: Recent Observations on the Morphology of the Neuron, and on the Changes which it Undergoes in Disease. (Oliver-Sharpey lectures.)

UNIVERSITY OF GLASGOW.
TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church-street), Dr. John Marshall: Diseases of Eyelids, Conjunctiva and Cornea.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland-place, W.
WEDNESDAY.—3.30 P.M., Mr. Aleck Bourne: Influences which Undermine the Health of Women.

INSTITUTE OF PSYCHO-ANALYSIS, 96, Gloucester-place, W.
TUESDAY.—8.30 P.M., Dr. Edward Glover: Gastric and Circulatory Disturbances. (First of three lectures.)

INSTITUTE OF CHILD PSYCHOLOGY.
MONDAY.—6.15 P.M. (Friends House, Euston-road, N.W.), Mrs. Margaret Hay: Success in Middle Life. 8.15 P.M. Dr. Margaret Lowenfeld: Fulfilment in Life.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
WEDNESDAY.—12 noon, clinical and pathological conference (medical). 2 P.M., Dr. T. H. Belt: The Pneumokonioses. 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. Harington: The Thyroid and its Secretions.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Wilfred Shaw: Irregular Uterine Hæmorrhage. 4.30 P.M., Mr. Kenneth Walker: Venereal Diseases.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. Geoffrey Keynes: Diseases of the Breast.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

ST. GEORGE'S HOSPITAL, S.W.
THURSDAY.—5 P.M., Dr. Desmond Curran: psychiatric demonstration.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY.—3.30 P.M., Dr. Macdonald Critchley: Epilepia.
TUESDAY.—3.30 P.M., Dr. F. M. R. Walshe: Progressive Muscular Atrophy.
WEDNESDAY.—3.30 P.M., Dr. Walshe: clinical demonstration.
THURSDAY.—3.30 P.M., Dr. Denis Brinton: Vascular Disease of the Nervous System.
FRIDAY.—3.30 P.M., Dr. E. A. Carmichael: The Cerebellar Degenerations.
Out-patient clinic daily at 2 P.M.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY.—3 P.M., Dr. W. Russell Brain: clinical demonstration.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Dr. Wilfrid Sheldon: Anæmias, Jaundice, and Hæmorrhages in the New-born. 3 P.M., Dr. D. B. Bradshaw: Prophylaxis of Diphtheria and Scarlet Fever.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY.—4 P.M., Dr. H. C. Semon: Some Aspects of Cutaneous Allergy.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY.—4 P.M., Mr. W. A. Mill: Ear-ache in the Normal Ear.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. Paul Wood: Congestive Heart Failure.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY.—4.30 P.M., Dr. A. P. Cawadias: Physical Medicine in Metabolic and Gastro-Intestinal Diseases. (I.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SATURDAY.—ROYAL CHEST HOSPITAL, City-road, E.C., Mon., Wed., and Fri., 8 P.M., advanced course in chest and heart diseases. (Open to non-members.)—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., afternoon course in neurology.—PRESTON HALL, near Maidstone, Kent, Sat., demonstration on pulmonary tuberculosis.

LEEDS GENERAL INFIRMARY.
TUESDAY.—3.30 P.M., Mr. G. S. Seed: The Diagnosis and Treatment of Nasal Sinusitis.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Mr. F. G. Wrigley, clinical demonstration.

ANCOATS HOSPITAL, Manchester.
THURSDAY.—4.15 P.M., Mr. E. S. Brentnall: Treatment of Fractures of the Neck of the Femur.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY.—4.15 P.M. (Lock Hospital), Dr. David Watson: Venereal Disease in Women.

Births, Marriages, and Deaths

BIRTHS

FORMBY.—On March 15th, at Devonshire-place, W., the wife of Mr. Myles Landseer Formby, F.R.C.S. Eng.—a son.
FOSTER.—On March 6th, at Ancaster, Grantham, the wife of Dr. K. M. Foster—a daughter.
REES-JONES.—On March 9th, the wife of Dr. G. F. Rees-Jones, of Kelvedon—a daughter.
SANDELL.—On March 8th, at Sloane-street, S.W., the wife of Dr. David Sandell—a son.
THYNE.—On March 11th, at West Wimbledon, the wife of Dr. G. G. Thyne—a son.

MARRIAGES

DIVINE—SPEIRS.—On March 3rd, at St. Andrew's Cathedral, Singapore, Thomas A. Divine, M.B., to F. E. R. (Jane) Speirs, second daughter of Dr. H. M. Speirs, Diss, Norfolk.

DEATHS

BARTLETT.—On March 10th, at Southampton, Ralph Clarke Bartlett, M.R.C.S. Eng., formerly of Romsey.
CRAWFURD.—On March 9th, at a nursing-home, Sir Raymond Crawfurd, M.D. Oxon., F.R.C.P. Lond.
CUFF.—On March 9th, at Sheffield, Archibald William Cuff, M.B. Camb., F.R.C.S. Eng., J.P.
HAINES.—On March 15th, in London, John Finch Haines, M.D. R.U.I.
MANSELL.—On March 10th, at St. Leonards-on-Sea, Harry Rosser Mansell, M.R.C.S. Eng., aged 77.
PURKISS.—On March 10th, at Hastings, Arthur Purkiss, M.D. Aberd., in his 81st year.
TROUNCER.—On March 13th, at Benllech Bay, Anglesey, Charles Albert Trouncer, M.B. Camb., aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

EARLY MEDICAL BOOKS

ONE of the most interesting collections of rare books on medicine and surgery that have come on the market in recent years will appear at a London sale-room during April. It was mainly formed during the latter half of the seventeenth century by John Lawson, who was president of the Royal College of Physicians in 1685. At one time Oliver Cromwell sought to exercise his prerogative in order to have Lawson made a fellow of Queens' College, Cambridge, but the fellows of the college refused to admit him and this uncomplimentary proceeding may have had some bearing on the destination of Lawson's library, for on his death in 1705 he bequeathed it to Sion College. This cannot, even in those days, have been a very suitable gift, as Sion College library was designed for theological studies. In any case the excellent condition of the books shows that they were little studied by the fellows.

The great interest of the collection lies in its wealth of books by English medical writers of the sixteenth and the seventeenth century. There are first editions of Harvey's "De Motu Cordis," published at Frankfort in 1628, and of his "De Generatione Animalium," and works, sometimes signed presentation copies, by Glisson, Charleton, Boyle, Maynwaring, Sydenham, Gideon Harvey, and many others, including Banister and Vicary. Of these the first edition in English of Glisson's "Treatise of Rickets" is said to be the first monograph on a specific disease published in England. The great length of the title-pages in these old books is well shown in Thomas Bonham's "Chyrurgian's Closet, furnished with varietie and choyce of Apophlegms, Balmes, Baths, Caps, Cataplasmes, Cerots, Diets, Dentifrices, Gargarismes, Pils, Quilts, Suppositaries, Synapismes, Trochisces . . . , nowe drawne into Method and Forme for the helpe and ease of young Practitioners in the ancient, necessarie and noble Science of Chyrurgerie." Medical books bequeathed to Sion College during the hundred years or so after Lawson's death were also added to the library, and among these are the monographs of John and William Hunter.

Those responsible for the care of large libraries will endorse the decision of the president and governors of Sion College to dispose of this collection. It is much more likely to be kept in good repair in the future if acquired by medical institutions or collectors with a special interest in preserving these books and in making them accessible to students of medical history and literature.

A CASE OF SMALL-POX IN A SURGICAL WARD

THE recent arrival of a patient infected with virulent small-pox at one of our ports has recalled to Mr. T. B. Layton an incident which he records in his usual graphic style in the current issue of *Guy's Hospital Gazette*. One evening "some time ago" he was rung up by his house surgeon who reported the admission of a girl of sixteen with intense headache and a temperature of 104° F., presumably due to acute sinusitis. Next morning the girl was cheerfully sitting up in bed, without pain or pyrexia, and no abnormality was found in the nasal sinuses. Three days later, on a Sunday, the house surgeon, reporting some other case, remarked that the child had come out in an extraordinary rash which at first he had thought to be small-pox; but that one of the junior staff at the hospital had called it by the long name of some dermatological condition. Mr. Layton insisted that the person responsible for the diagnosis of small-pox in the area must see the case, and the medical officer of health for the area was therefore called in, agreed with the provisional diagnosis—something that ended with "exuditorans"—and gave reasons for his conviction that it was not small-pox. Two days afterwards the dermatologist was asked to see the patient and diagnosed small-pox. By this time it was a typical text-book case; when the medical officer of health came again he brought with him the small-pox expert on duty for the week, who till his retirement never ceased to remind Mr. Layton of the occasion when he kept a case of small-pox in the surgical ward of a general hospital for nearly a week. Fortunately only two contacts caught the disease and they were the only two whose vaccination was delayed by parental opposition. All the other contacts were vaccinated immediately the diagnosis had been established, and Mr. Layton comments on their escape as evidence of the value of vaccination after exposure. He draws other morals from this tale: one is that small-pox in its early stages can be mistaken for acute sinusitis; another is the value of the code generally adopted by members of the junior staff—of refusing to see a case under another firm without the knowledge of the head of the firm; and a third, that it is fatally easy to make a wrong diagnosis as a result of suggestion. No doubt, he suggests, the medical officer of health was met at the gate with apologies for taking him from his Sunday lunch to see a case whose diagnosis merely ended with exuditorans.

MEDICAL NEEDS IN THE UNITED STATES

BY way of answer to the complaint that their programme contains no constructive policy for bringing better medical care within the means of every citizen, the board of trustees of the American Medical Association recently adopted resolutions designed to encourage State and county medical societies to study the needs for medical services in their respective areas, and to formulate plans for meeting those needs in accordance with the established policies of the Association (see *Lancet*, Feb. 5th, 1938, p. 329). In collecting this information some uniformity of procedure was evidently desirable, and the *Journal* of the Association for Feb. 12th contains a suggested plan of study. Each society is recommended to appoint a special committee to collect information and it is emphasised that those responsible for its collection and analysis should have sufficient knowledge to appreciate the "values and processes in the practice of medicine." It is thought that some of the previous studies of the subject contain errors traceable to the work of non-medical persons without appreciation of the elements involved in the care of the sick. Each kind of medical service is to be studied from both the demand and the supply sides, and the completed report should "strike a balance." Information is to be obtained concerning private practice, hospitals, independent clinics (unconnected with hospitals), health departments, relief agencies—private and governmental—and educational institutions. The object of the study is to remove obstacles between patient and physician, whether arising from economic conditions, failure to appreciate the value of medical services, or definite deficiencies in the facilities available for medical care; and it is thought necessary that precise information should be obtained under each of these heads. Generally, the societies are urged:

"To determine as completely as possible the percentage of the persons in low-income classes receiving care from private and public agencies; the percentage of total services given by these agencies to the indigent and low-income groups; the extent to which tax-supported

institutions accept patients who are able to pay full rates, and the number of individuals or families that have been denied medical services which they have sought. It is of equal importance to discover, if possible, the number of persons who presumably need medical services but have not attempted to obtain such services for the reason that they do not desire medical care. Furthermore, there may still be another group of persons who need and desire medical services but who, for reasons that should be discovered, fail to seek medical attention."

Prosecuted, as it doubtless will be, with characteristic American energy, this inquiry may well provide further valuable evidence of the requirements to be met.

GARDEN CITIES

THE essential idea of a garden city is that it is a self-contained social unit where people may both live and work. Planning beforehand defines the parts of the town which will be allotted to industry, homes, roads, open spaces, agriculture, or shops, and the owners of the land ensure that their plan is carried out. The garden city is bounded by a green belt which makes for health, limits the size of the town, provides small holdings, allotments, playing fields, and opportunities for country walks, and helps to bind the people of the town together. There is none of the usual expense of travelling to and from work; the people can have their meals at home and grow their vegetables in their own gardens. There are in this country two garden cities, Letchworth and Welwyn; a number of garden suburbs, of which Hampstead is the best known example; and one planned satellite town, Wythenshawe near Manchester. In a recent pamphlet (Health and Garden Cities) issued by the Garden Cities and Town Planning Association Dr. Norman Macfadyen gives some vital statistics of these towns. The death-rate in Welwyn is 5·9 per thousand, compared with 12 for England and Wales, the tuberculosis rate is 0·574 per thousand compared with 0·804, the infant mortality-rate is 25 compared with 62 for the whole country, and for some years Welwyn has had a birth-rate of 20. In Letchworth the days lost through illness every year by the members of a large friendly society are just over two per member, whereas in the whole of England and Wales they average about four. Dr. Macfadyen concludes that the conditions of life in a garden city are at present the healthiest in the country.

PNEUMOTHORAX FOR ECHINOCOCCAL CYSTS OF LUNG

IN *Policlinico* (sez. prat. Feb. 7th, 1938, p. 233) G. Roberti describes a case of echinococcal cyst of the lung successfully treated, under a mistaken diagnosis of tuberculosis, by artificial pneumothorax.

The patient, a youth of 18, was admitted to a sanatorium as having pulmonary tuberculosis, with a two months' history of cough, blood-stained expectoration, evening pyrexia, and general malaise. Examination revealed diminished resonance and distant breath-sounds all over the left upper lobe. Radiography showed a zone of opacity, oval in shape, and about the size of a hen's egg, at the upper part of the hilar region. The sputum contained no tubercle bacilli.

Three months after admission the symptoms and physical signs were unchanged despite the ordinary sanatorium treatment, and it was decided to induce pneumothorax. This was successfully done, as shown by subsequent radiography. Sixteen days later, to everyone's surprise, the patient coughed up a large fragment of chitinous membrane and a quantity of pus and blood. The latter was found on microscopic examination to contain scolices and hooklets. Casoni's test was strongly positive, and a blood count showed 6 per cent. of eosinophil cells.

The pneumothorax was maintained for eighteen months, during which time the cyst was by degrees completely expelled, with disappearance of the hilar shadow. It was then discontinued and the patient was discharged shortly afterwards in good health.

Roberti suggests that artificial pneumothorax deserves consideration as a method of treating echinococcal cyst of the lung in suitable cases—i.e., those in which surgical approach is especially difficult and there is good opportunity for drainage.

MILK CARTONS

FOR some years past attempts have been made to popularise the use of paper cartons for the delivery of milk to the consumer. Three independent firms are now manufacturing cartons in this country and several large dairies make their own from the flat just before filling them. Cartons have many advantages over glass bottles and have undoubtedly come to stay for certain classes of trade. Their saving in weight is considerable. A pint bottle weighs over a pound and a milk roundsman may therefore be called upon to carry 200 to 300 lb. of glass when the same milk could be taken in cartons weighing less than 20 lb. The fact that cartons are non-returnable, although it makes them considerably more expensive, saves time in collecting empties and makes them ideal for seaside and holiday trade; at the same time it eliminates the laborious task of bottle washing and the very real danger that may arise from improperly washed bottles. Tests conducted at the National Institute of Research in Dairying show that the containers supplied to dairymen ready for use are in a state of freedom from bacteria equal to the highest standard of cleanliness laid down for glass bottles; the majority are, in fact, sterile. Milk has also been shown to keep as well in cartons as in steam-sterilised bottles, and even after several days the cartons do not appreciably affect its flavour.

DISCLAIMERS

Count Castellani of Kisymaio writes in reference to articles which have recently appeared in various lay daily papers during his visit to America that he granted no interviews and the articles were published without his knowledge.

Dr. Geoffrey Konstam writes to say that the mention of his name and address in an article in a daily paper concerning an operation on a hospital patient was made without his knowledge or consent. The information was apparently given to the press by a member of the patient's family.

ORTHOPÆDIC NURSING

THE development of orthopædic hospitals and of orthopædic departments in general hospitals has called into being a new branch of nursing. A sister in charge of an orthopædic ward, and perhaps still more a nurse working at an orthopædic clinic, must have certain special knowledge to fit her for such work. In this country an attempt is being made by the Central Council for the Care of Cripples to meet this need by the holding of an examination for a special orthopædic certificate. Whether or not this is a desirable innovation is a matter of opinion, but it is certain that a reliable book on orthopædic nursing will help those who are working in hospitals or clinics. That by Dr. Earl McBride and Miss Winifred Sink,[1] now in its second edition, gives an excellent account of all that (and perhaps more than) an orthopædic nurse should be expected to know. It is written in a clear, easy style, and is well illustrated. It is somewhat of a shock to find a chapter devoted to hernia, but perhaps this is a gesture of respect to the venerable Hospital for the Ruptured and Crippled in New York City.

[1] Crippled Children: Their Treatment and Orthopedic Nursing. Second edition. By Earl D. McBride, B.S., M.D., F.A.C.S., Assistant Professor of Orthopedic Surgery, University of Oklahoma, in collaboration with Winifred R. Sink, A.B., R.N., Education Director, Grace Hospital School of Nursing, Detroit, Michigan. London: Henry Kimpton. 1937 Pp. 379. 18s.